

THE STATE OF TEXAS §

COUNTY OF TRAVIS §

CONTRACT FOR ENGINEERING SERVICES
Cost Plus Fixed Fee,
Unit Cost, Lump Sum, or Specified Rate
Indefinite Deliverable with Work Authorizations

THIS CONTRACT FOR ENGINEERING SERVICES is made by and between the State of Texas acting by and through the Texas Department of Transportation, 125 E. 11th St., Austin, Texas 78701, hereinafter called "State," and **Klotz Associates, Inc.**, having its principal business address at **1160 Dairy Ashford, Suite 500, Houston, Texas 77079**, hereinafter called "Engineer," for the purpose of contracting for engineering services.

WITNESSETH

WHEREAS, Government Code, Chapter 2254, Subchapter A, "Professional Services Procurement Act," provides for the procurement of engineering services; and

WHEREAS, 43 Texas Administrative Code §9.30 et seq. establishes the Texas Department of Transportation's policies and procedures for contracting for engineering services; and,

WHEREAS, the State desires to contract for engineering services generally described as **providing preliminary engineering services for development of a schematic design layout, environmental studies in support of the schematic work, public involvement, permit procurement, data collection analysis, mitigation and remediation, monitoring, traffic engineering and operations including traffic simulations and 3-D modeling, and surveying and mapping for various highway projects located within the State of Texas;** and,

WHEREAS, the State has selected the Engineer to provide the needed services and the Engineer has agreed to provide the services subject to the terms and conditions hereinafter set forth.

NOW, THEREFORE, the State and the Engineer, in consideration of the mutual covenants and agreements herein contained, do hereby mutually agree as follows.

AGREEMENT

ARTICLE 1. SCOPE OF SERVICES. The State and the Engineer will furnish items and perform those services for fulfillment of the contract as identified in Attachment B, Services to be Provided by the State and Attachment C, Services to be Provided by the Engineer. All services provided by the Engineer will conform to standard engineering practices and applicable rules and regulations of the Texas Engineering Practices Act and the rules of the Texas Board of Professional Engineers.

ARTICLE 2. CONTRACT PERIOD. This contract becomes effective when fully executed by all parties hereto and it shall terminate at the close of business on **September 30, 2019** unless the contract period is: (1) modified by written supplemental agreement prior to the date of termination as set forth in Attachment A, General Provisions, Article 6, Supplemental Agreements; (2) extended due to a work suspension as provided for in Attachment A, Article 3, Paragraph C; or (3) otherwise terminated in accordance with Attachment A, General Provisions, Article 15, Termination. Any work performed or cost incurred before or after the contract period shall be ineligible for reimbursement.

The maximum contract time is the time needed to complete all work authorizations that will be issued in the first two years of the contract. All work authorizations must be issued within the initial two-year period, starting from the contract execution date.

ARTICLE 3. COMPENSATION.

A. Maximum Amount Payable. The maximum amount payable under this contract without modification is shown in Attachment E, Fee Schedule. Payment under this contract beyond the end of the current fiscal biennium is subject to availability of appropriated funds. If funds are not appropriated, this contract shall be terminated immediately with no liability to either party.

B. Basis of Payment. The basis of payment is identified in Attachment E, Fee Schedule. Reimbursement of costs incurred under a work authorization shall be in accordance with Attachment E, Fee Schedule.

C. Reimbursement of Eligible Costs. To be eligible for reimbursement, the Engineer's costs must (1) be incurred in accordance with the terms of a valid work authorization; (2) be in accordance with Attachment E, Fee Schedule; and (3) comply with cost principles set forth at 48 CFR Part 31, Federal Acquisition Regulation (FAR 31). Satisfactory progress of work shall be maintained as a condition of payment.

D. Engineer Payment of Subproviders. No later than ten (10) days after receiving payment from the State, the Engineer shall pay all subproviders for work performed under a subcontract authorized hereunder. The State may withhold all payments that have or may become due if the Engineer fails to comply with the ten-day payment requirement. The State may also suspend the work under this contract or any work authorization until subproviders are paid. This requirement also applies to all lower tier subproviders, and this provision must be incorporated into all subcontracts.

ARTICLE 4. PAYMENT REQUIREMENTS

A. Monthly Billing Statements. The Engineer shall request reimbursement of costs incurred by submitting the original and one copy of an itemized billing statement in a form acceptable to the State. The Engineer is authorized to submit requests for reimbursement no more frequently than monthly and no later than ninety (90) days after costs are incurred.

B. Billing Statement. The billing statement shall show the work authorization number for each work authorization included in the billing, the total amount earned to the date of submission, and the amount due and payable as of the date of the current billing statement for each work authorization. The billing statement shall indicate if the work has been completed or if the billing is for partial completion of the work. The fixed fee will be paid in proportion to the percentage of work completed per work authorizations.

C. Overhead Rates. The Engineer shall use the provisional overhead rate indicated in Attachment E. If a periodic escalation of the provisional overhead rate is specified in Attachment E, the effective date of the revised provisional overhead rate must be included. For lump sum contracts, the overhead rate remains unchanged for the entire contract period.

D. Thirty Day Payments. Upon receipt of a billing statement that complies with all invoice requirements set forth in this Article, the State shall make a good faith effort to pay the amount which is due and payable within thirty (30) days.

E. Withholding Payments. The State reserves the right to withhold payment of the Engineer's billing statement in the event of any of the following: (1) If a dispute over the work or costs thereof is not resolved within a thirty day period; (2) pending verification of satisfactory work performed; (3) the Engineer becomes a delinquent obligor as set forth in Section 231.006 of the Family Code; (4) required reports are not received; or (5) the State Comptroller of Public Accounts will not issue a warrant to the Engineer. In the event that payment is withheld, the State shall notify the Engineer and give a remedy that would allow the State to release the payment.

F. Required Reports.

(1) As required in Attachment H, Disadvantaged Business Enterprise or Historically Underutilized Business Program Requirements, the Engineer shall submit Progress Assessment Reports to report actual payments made to Disadvantaged Business Enterprises or Historically Underutilized Businesses. One copy shall be submitted with each billing statement and one copy shall be submitted to the address included in Attachment H, Disadvantaged Business Enterprise or Historically Underutilized Business Program Requirements.

(2) Prior to contract closeout, the Engineer shall submit a Final Report (Exhibit H-4) to the address set forth in Attachment H.

(3) The Engineer shall submit a separate report with each billing statement showing the percent completion of the work accomplished during the billing period and the percent completion to date, and any additional written report requested by the State to document the progress of the work.

G. Subproviders and Suppliers List. Pursuant to requirements of 43 Texas Administrative Code §9.50 et seq., the Engineer must provide the State a list (Exhibit H-5/DBE or Exhibit H-6/HUB) of all Subproviders and suppliers

that submitted quotes or proposals for subcontracts. This list shall include subproviders and suppliers names, addresses, telephone numbers, and type of work desired.

H. Debt to the State. If the State Comptroller of Public Accounts is prohibited from issuing a warrant or initiating an electronic funds transfer to the Engineer because of a debt owed to the State, the State shall apply all payment due the Engineer to the debt or delinquent tax until the debt or delinquent tax is paid in full.

I. Audit. The state auditor may conduct an audit or investigation of any entity receiving funds from the state directly under the contract or indirectly through a subcontract under the contract. Acceptance of funds directly under the contract or indirectly through a subcontract under this contract acts as acceptance of the authority of the state auditor, under the direction of the legislative audit committee, to conduct an audit or investigation in connection with those funds. An entity that is the subject of an audit or investigation must provide the state auditor with access to any information the state auditor considers relevant to the investigation or audit.

ARTICLE 5. WORK AUTHORIZATIONS. The State will issue work authorizations using the form included in Attachment D (Work Authorizations and Supplemental Work Authorizations) to authorize all work under this contract. The Engineer must sign and return a work authorization within seven (7) working days after receipt. Refusal to accept a work authorization may be grounds for termination of the contract. The State shall not be responsible for actions by the Engineer or any costs incurred by the Engineer relating to work not directly associated with or prior to the execution of a work authorization. Terms and conditions governing the use of work authorizations are set forth in Attachment A, General Provisions, Article 1.

ARTICLE 6. SIGNATORY WARRANTY. The undersigned signatory for the Engineer hereby represents and warrants that he or she is an officer of the organization for which he or she has executed this contract and that he or she has full and complete authority to enter into this contract on behalf of the firm. These representations and warranties are made for the purpose of inducing the State to enter into this contract.

ARTICLE 7. All notices to either party by the other required under this agreement shall be delivered personally or sent by certified or U.S. mail, postage prepaid, addressed to such party at the following addresses:

Engineer:	State:
Project Manager Klotz Associates, Inc. 1160 Dairy Ashford, Suite 500 Houston, Texas 77079	Director, Professional Engineering Procurement Services Texas Department of Transportation 125 E. 11 th Street Austin, Texas 78701

All notices shall be deemed given on the date so delivered or so deposited in the mail, unless otherwise provided herein. Either party may change the above address by sending written notice of the change to the other party. Either party may request in writing that such notices shall be delivered personally or by certified U.S. mail and such request shall be honored and carried out by the other party.

ARTICLE 8. INCORPORATION OF PROVISIONS. Attachments A through H are attached hereto and incorporated into this contract as if fully set forth herein.

IN WITNESS WHEREOF, the **State** and the **Engineer** have executed this contract in duplicate.

THE ENGINEER



(Signature)

Peter Fearn

(Printed Name)

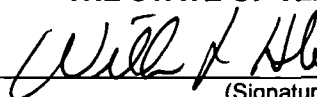
President

(Title)

09-24-15

(Date)

THE STATE OF TEXAS



(Signature)

William L. Hale, P.E.

Chief Engineer

(Title)

10/6/15

(Date)

**Attachments to Contract for Engineering Services
Incorporated into the Contract by Reference**

Attachments	Title
A	General Provisions
B	Services to Be Provided by the State
C	Services to Be Provided by the Engineer
D	Work Authorization and Supplemental Work Authorization
E	Fee Schedule
F	Not Applicable
G	Computer Graphics Files for Document and Information Exchange, if applicable
H-FG	Disadvantaged Business Enterprise (DBE) for Federal Funded Professional or Technical Services Contracts – See Attachment H Instructions N/A
H – FN	Disadvantaged Business Enterprise (DBE) for Race-Neutral Professional or Technical Services Contracts – See Attachment H Instructions N/A
H – SG	Historically Underutilized Business (HUB) Requirements for State Funded Professional or Technical Services Contracts – State of Texas HUB. Subcontracting plan required – See Attachment H Instructions
H – SN	Historically Underutilized Business (HUB) Requirements for State Funded Professional or Technical Services Contracts – No State of Texas HUB N/A
Exhibits	Title
H – 1	Subprovider Monitoring System Commitment Worksheet
H – 2	Subprovider Monitoring System Commitment Agreement
H – 3	Monthly Progress Assessment Report N/A
H - 4	Subprovider Monitoring System Final Report
H - 5	Federal Subproviders and Supplier Information N/A
H - 6	HUB Subcontracting Plan (HSP) Prime Contractor Progress Assessment Report

ATTACHMENT A**GENERAL PROVISIONS****INDEX TO PROVISIONS**

Article	Title
1	Work Authorizations
2	Progress
3	Suspension of Work
4	Additional Work
5	Changes in Work
6	Supplemental Agreements
7	Ownership of Data
8	Public Information
9	Personnel, Equipment and Material
10	License for TxDOT Logo Use
11	Subcontracting
12	Inspection of Work
13	Submission of Reports
14	Violation of Contract Terms
15	Termination
16	Compliance with Laws
17	Indemnification
18	Engineer's Responsibility
19	Non-collusion
20	Insurance
21	Gratuities
22	DBE/HUB Requirements
23	Maintenance, Retention and Audit of Records
24	Nepotism Disclosure
25	Civil Rights Compliance
26	Patent Rights
27	Computer Graphics Files
28	Child Support Certification
29	Disputes
30	Successors and Assigns
31	Severability
32	Prior Contracts Superseded
33	Conflict of Interest
34	Office of Management and Budget (OMB) Audit Requirements
35	Debarment Certifications
36	E-Verify Certification
37	Restrictions on Employment of Former State Officer or Employee

ATTACHMENT A

GENERAL PROVISIONS

ARTICLE 1. WORK AUTHORIZATIONS

A. Use. The Engineer shall not begin any work until the State and the Engineer have signed a work authorization. Costs incurred by the Engineer before a work authorization is fully executed or after the completion date specified in the work authorization are not eligible for reimbursement. All work must be completed on or before the completion date specified in the work authorization, and no work authorization completion date shall extend beyond the contract period set forth in Article 2 of the contract (Contract Period).

The maximum contract time is the time needed to complete all work authorizations that will be issued in the first two years of the contract. All work authorizations must be issued within the initial two-year period, starting from the contract execution date.

B. Contents. Each work authorization will specify (1) the types of services to be performed; (2) a period of performance with a beginning and ending date; (3) a full description of the work to be performed; (4) a work schedule with milestones; (5) a cost not to exceed amount, (6) the basis of payment whether cost plus fixed fee, unit cost, lump sum, or specified rate; and (7) a work authorization budget calculated using fees set forth in Attachment E, Fee Schedule. The Engineer is not to include additional contract terms and conditions in the work authorization. In the event of any conflicting terms and conditions between the work authorization and the contract, the terms and conditions of the contract shall prevail and govern the work and costs incurred.

C. Work Authorization Budget. A work authorization budget shall set forth in detail (1) the computation of the estimated cost of the work as described in the work authorization, (2) the estimated time (hours/days) required to complete the work at the hourly rates established in Attachment E, Fee Schedule; (3) a work plan that includes a list of the work to be performed, (4) a stated maximum number of calendar days to complete the work, and (5) a cost-not-to-exceed-amount or unit or lump sum cost and the total cost or price of the work authorization. The State will not pay items of cost that are not included in or rates that exceed those approved in Attachment E.

D. No Guaranteed Work. Work authorizations are issued at the discretion of the State. While it is the State's intent to issue work authorizations hereunder, the Engineer shall have no cause of action conditioned upon the lack or number of work authorizations issued.

E. Incorporation into Contract. Each work authorization shall be signed by both parties and become a part of the contract. No work authorization will waive the State's or the Engineer's responsibilities and obligations established in this contract. The Engineer shall promptly notify the State of any event that will affect completion of the work authorization.

F. Supplemental Work Authorizations. Before additional work may be performed or additional costs incurred, a change in a work authorization shall be enacted by a written supplemental work authorization in the form identified and attached hereto as Attachment D. Both parties must execute a supplemental work authorization within the period of performance specified in the work authorization. The State shall not be responsible for actions by the Engineer or any costs incurred by the Engineer relating to additional work not directly associated with the performance or prior to the execution of the work authorization. The Engineer shall allow adequate time for review and approval of the supplemental work authorization by the State prior to expiration of the work authorization. Any supplemental work authorization must be executed by both parties within the time period established in Article 2 of the contract, (Contract Period). Under no circumstances will a work authorization be allowed to extend beyond the contract's expiration date or will the total amount of funds exceed the maximum amount payable set forth in Article 3A of the contract (Compensation).

F-1. More Time Needed. If the Engineer determines or reasonably anticipates that the work authorized in a work authorization cannot be completed before the specified completion date, the Engineer shall promptly notify the State. The State may, at its sole discretion, extend the work authorization period by execution of supplemental authorization, using the form attached hereto as Attachment D.

F-2. Changes in Scope. Changes that would modify the scope of the work authorized in a work authorization must be enacted by a written supplemental work authorization. The Engineer must allow

adequate time for the State to review and approve any request for a time extension prior to expiration of the work authorization. If the change in scope affects the amount payable under the work authorization, the Engineer shall prepare a revised work authorization budget for the State's approval.

G. New Work Authorization. If the Engineer does not complete the services authorized in a work authorization before the specified completion date and has not requested a supplemental work authorization, the work authorization shall terminate on the completion date. At the sole discretion of the State, it may issue a new work authorization to the Engineer for the incomplete work using the unexpended balance of the preceding work authorization for the project. If approved by the State, the Engineer may calculate any additional cost for the incomplete work using the rates set forth in the preceding work authorization and in accordance with Attachment E, Fee Schedule.

H. Emergency Work Authorizations. The State, at its sole discretion, may accept the Engineer's signature on a faxed copy of the work authorization as satisfying the requirements for executing the work authorization, provided that the signed original is received by the State within five business days from the date on the faxed copy.

I. Proposal Work Authorizations. The State may issue a proposal work authorization under which the Engineer will submit a proposal for additional work. The proposal must be for additional work that is within the defined scope of work under this contract. The amount to be paid for a proposal work authorization will be a lump sum for each proposal. The lump sum payment will be no less than two percent (2%) and no more than four percent (4%) of the State's estimate of the cost of the additional work. The Engineer may elect without penalty not to submit a proposal in response to a proposal work authorization. Any proposal submitted in response to a proposal work authorization will be the sole property of the State. The State may, at its option, issue similar or identical proposal work authorizations under other contracts, and the proposals submitted in response to the various proposal work authorizations may be compared by the State for the purpose of determining the contract under which the work will be awarded. The determination of the contract under which the work will be awarded will be based on the design characteristics of the proposal and the Engineer's qualifications and will not consider the Engineer's rates.

J. Deliverables. Upon satisfactory completion of the work authorization, the Engineer shall submit the deliverables as specified in the executed work authorization to the State for review and acceptance.

ARTICLE 2. PROGRESS

A. Progress meetings. The Engineer shall from time to time during the progress of the work confer with the State. The Engineer shall prepare and present such information as may be pertinent and necessary or as may be requested by the State in order to evaluate features of the work.

B. Conferences. At the request of the State or the Engineer, conferences shall be provided at the Engineer's office, the office of the State, or at other locations designated by the State. These conferences shall also include evaluation of the Engineer's services and work when requested by the State.

C. Inspections. If federal funds are used to reimburse costs incurred under this contract, the work and all reimbursements will be subject to periodic review by the U. S. Department of Transportation.

D. Reports. The Engineer shall promptly advise the State in writing of events that have a significant impact upon the progress of a work authorization, including:

1. problems, delays, adverse conditions that will materially affect the ability to meet the time schedules and goals, or preclude the attainment of project work units by established time periods; this disclosure will be accompanied by statement of the action taken or contemplated, and any State or federal assistance needed to resolve the situation; and
2. favorable developments or events which enable meeting the work schedule goals sooner than anticipated.

E. Corrective Action. Should the State determine that the progress of work does not satisfy the milestone schedule set forth in a work authorization, the State shall review the work schedule with the Engineer to determine the nature of corrective action needed.

ARTICLE 3. SUSPENSION OF WORK AUTHORIZATION

A. Notice. Should the State desire to suspend a work authorization but not terminate the contract, the State may verbally notify the Engineer followed by written confirmation, giving (30) thirty days notice. Both parties may waive the thirty-day notice in writing.

B. Reinstatement. A work authorization may be reinstated and resumed in full force and effect within sixty (60) business days of receipt of written notice from the State to resume the work. Both parties may waive the sixty-day notice in writing.

C. Contract Period Not Affected. If the State suspends a work authorization, the contract period as determined in Article 2 of the contract (Contract Period) is not affected and the contract and the work authorization will terminate on the date specified unless the contract or work authorization is amended to authorize additional time.

D. Limitation of Liability. The State shall have no liability for work performed or costs incurred prior to the date authorized by the State to begin work, during periods when work is suspended, or after the completion date of the contract or work authorization.

ARTICLE 4. ADDITIONAL WORK

A. Notice. If the Engineer is of the opinion that any assigned work is beyond the scope of this contract and constitutes additional work, it shall promptly notify the State in writing, presenting the facts of the work authorization and showing how the work authorization constitutes additional work.

B. Supplemental Agreement. If the State finds that the work does constitute additional work, the State shall so advise the Engineer and a written supplemental agreement will be executed as provided in General Provisions, Article 6, Supplemental Agreements.

C. Limitation of Liability. The State shall not be responsible for actions by the Engineer or any costs incurred by the Engineer relating to additional work not directly associated with or prior to the execution of a supplemental agreement.

ARTICLE 5. CHANGES IN WORK

A. Work Previously Submitted as Satisfactory. If the Engineer has submitted work in accordance with the terms of this contract but the State requests changes to the completed work or parts thereof which involve changes to the original scope of services or character of work under the contract, the Engineer shall make such revisions as requested and as directed by the State. This will be considered as additional work and paid for as specified under Article 4, Additional Work.

B. Work Does Not Comply with Contract. If the Engineer submits work that does not comply with the terms of this contract, the State shall instruct the Engineer to make such revision as is necessary to bring the work into compliance with the contract. No additional compensation shall be paid for this work.

C. Errors/Omissions. The Engineer shall make revisions to the work authorized in this contract which are necessary to correct errors or omissions appearing therein, when required to do so by the State. No additional compensation shall be paid for this work.

ARTICLE 6. SUPPLEMENTAL AGREEMENTS

A. Need. The terms of this contract may be modified if the State determines that there has been a significant increase or decrease in the duration, scope, cost, complexity or character of the services to be performed. A supplemental agreement will be executed to authorize such significant increases or decreases. Significant is defined to mean a cost increase of any amount and a cost decrease of twenty percent (20%) or more of the original estimated project cost.

B. Compensation. Additional compensation, if appropriate, shall be calculated as set forth in Article 3 of the contract (Compensation). Significant changes affecting the cost or maximum amount payable shall be defined to include but not be limited to new work not previously authorized or previously authorized services that will not be performed. The parties may reevaluate and renegotiate costs at this time.

C. When to Execute. Both parties must execute a supplemental agreement within the contract period specified in Article 2 of the contract (Contract Period).

ARTICLE 7. OWNERSHIP OF DATA

A. Work for Hire. All services provided under this contract are considered work for hire and as such all data, basic sketches, charts, calculations, plans, specifications, and other documents created or collected under the terms of this contract are the property of the State.

B. Disposition of Documents. All documents prepared by the Engineer and all documents furnished to the Engineer by the State shall be delivered to the State upon request by the State. The Engineer, at its own expense, may retain copies of such documents or any other data which it has furnished the State under this contract, but further use of the data is subject to permission by the State.

C. Release of Design Plan. The Engineer (1) will not release any roadway design plan created or collected under this contract except to its subproviders as necessary to complete the contract; (2) shall include a provision in all subcontracts which acknowledges the State's ownership of the design plan and prohibits its use for any use other than the project identified in this contract; and (3) is responsible for any improper use of the design plan by its employees, officers, or subproviders, including costs, damages, or other liability resulting from improper use. Neither the Engineer nor any subprovider may charge a fee for the portion of the design plan created by the State.

ARTICLE 8. PUBLIC INFORMATION AND CONFIDENTIALITY

A. Public Information. The State will comply with Government Code, Chapter 552, the Public Information Act, and 43 Texas Administrative Code §3.10 et seq. in the release of information produced under this contract.

B. Confidentiality. The Engineer shall not disclose information obtained from the State under this contract without the express written consent of the State.

C. Access to Information. The Engineer is required to make any information created or exchanged with the state pursuant to this contract, and not otherwise excepted from disclosure under the Texas Public Information Act, available in a format that is accessible by the public at no additional charge to the state.

ARTICLE 9. PERSONNEL, EQUIPMENT AND MATERIAL

A. Engineer Resources. The Engineer shall furnish and maintain quarters for the performance of all services, in addition to providing adequate and sufficient personnel and equipment to perform the services required under the contract. The Engineer certifies that it presently has adequate qualified personnel in its employment for performance of the services required under this contract, or it will be able to obtain such personnel from sources other than the State.

B. Removal of Contractor Employee. All employees of the Engineer assigned to this contract shall have such knowledge and experience as will enable them to perform the duties assigned to them. The State may instruct the Engineer to remove any employee from association with work authorized in this contract if, in the sole opinion of the State, the work of that employee does not comply with the terms of this contract or if the conduct of that employee becomes detrimental to the work.

C. Replacement of Key Personnel. The Engineer must notify the State in writing as soon as possible, but no later than three business days after a project manager or other key personnel is removed from association with this contract, giving the reason for removal.

D. State Approval of Replacement Personnel. The Engineer may not replace the project manager or key personnel without prior consent of the State. The State must be satisfied that the new project manager or other key personnel is qualified to provide the authorized services. If the State determines that the new project manager or key personnel is not acceptable, the Engineer may not use that person in that capacity and shall replace him or her with one satisfactory to the State within forty-five (45) days.

E. Ownership of Acquired Property. Except to the extent that a specific provision of this contract states to the contrary, the State shall own all intellectual property acquired or developed under this contract and all

equipment purchased by the Engineer or its subcontractors under this contract. All intellectual property and equipment owned by the State shall be delivered to the State when the contract terminates, or when it is no longer needed for work performed under this contract, whichever occurs first.

ARTICLE 10. LICENSE FOR TxDOT LOGO USE

A. Grant of License; Limitations. The Engineer is granted a limited revocable non-exclusive license to use the registered TxDOT trademark logo (TxDOT Flying "T") on any deliverables prepared under this contract that are the property of the State. The Engineer may not make any use of the registered TxDOT trademark logo on any other materials or documents unless it first submits that request in writing to the State and receives approval for the proposed use. The Engineer agrees that it shall not alter, modify, dilute, or otherwise misuse the registered TxDOT trademark logo or bring it into disrepute.

B. Notice of Registration Required: The Engineer's use of the Flying 'T' under this article shall be followed by the capital letter R enclosed within a circle (®) that gives notice that the Flying 'T' is registered in the United States Patent and Trademark Office (USPTO).

C. No Assignment or Sublicense. The Engineer may not assign or sublicense the rights granted by this article without the prior written consent of the State.

D. Term of License. The license granted to the Engineer by this article shall terminate at the end of the term specified in Article 2 of this contract.

ARTICLE 11. SUBCONTRACTING

A. Prior Approval. The Engineer shall not assign, subcontract or transfer any portion of professional services related to the work under this contract without prior written approval from the State.

B. DBE/HUB Compliance. The Engineer's subcontracting program shall comply with the requirements of Attachment H of the contract (DBE/HUB Requirements).

C. Required Provisions. All subcontracts for professional services shall include the provisions included in Attachment A, General Provisions, and any provisions required by law. The Engineer is authorized to pay subproviders in accordance with the terms of the subcontract, and the basis of payment may differ from the basis of payment by the State to the Engineer.

D. Prior Review. Subcontracts for professional services in excess of \$25,000 may be reviewed by the State prior to performance of work thereunder.

E. Engineer Responsibilities. No subcontract relieves the Engineer of any responsibilities under this contract.

ARTICLE 12. INSPECTION OF WORK

A. Review Rights. The State and the U.S. Department of Transportation, when federal funds are involved, and any of their authorized representatives shall have the right at all reasonable times to review or otherwise evaluate the work performed hereunder and the premises in which it is being performed.

B. Reasonable Access. If any review or evaluation is made on the premises of the Engineer or a subprovider, the Engineer shall provide and require its subproviders to provide all reasonable facilities and assistance for the safety and convenience of the state or federal representatives in the performance of their duties.

ARTICLE 13. SUBMISSION OF REPORTS

All applicable study reports shall be submitted in preliminary form for approval by the State before a final report is issued. The State's comments on the Engineer's preliminary report must be addressed in the final report.

ARTICLE 14. VIOLATION OF CONTRACT TERMS

A. Increased Costs. Violation of contract terms, breach of contract, or default by the Engineer shall be grounds for termination of the contract, and any increased or additional cost incurred by the State arising from the Engineer's default, breach of contract or violation of contract terms shall be paid by the Engineer.

B. Remedies. This agreement shall not be considered as specifying the exclusive remedy for any default, but all remedies existing at law and in equity may be availed of by either party and shall be cumulative.

ARTICLE 15. TERMINATION

A. Causes. The contract may be terminated before the stated completion date by any of the following conditions.

1. By mutual agreement and consent, in writing from both parties.
2. By the State by notice in writing to the Engineer as a consequence of failure by the Engineer to perform the services set forth herein in a satisfactory manner.
3. By either party, upon the failure of the other party to fulfill its obligations as set forth herein.
4. By the State for reasons of its own, not subject to the mutual consent of the Engineer, by giving thirty business days notice of termination in writing to the Engineer.
5. By the State, if the Engineer violates the provisions of Attachment A, General Provisions Article 21, Gratuities, or Attachment H, Disadvantaged Business Enterprise/Historically Underutilized Business Requirements.
6. By satisfactory completion of all services and obligations described herein.

B. Measurement. Should the State terminate this contract as herein provided, no fees other than fees due and payable at the time of termination shall thereafter be paid to the Engineer. In determining the value of the work performed by the Engineer prior to termination, the State shall be the sole judge. Compensation for work at termination will be based on a percentage of the work completed at that time. Should the State terminate this contract under paragraph (4) or (5) above, the Engineer shall not incur costs during the thirty-day notice period in excess of the amount incurred during the preceding thirty days.

C. Value of Completed Work. If the Engineer defaults in the performance of this contract or if the State terminates this contract for fault on the part of the Engineer, the State will give consideration to the following when calculating the value of the completed work: (1) the actual costs incurred (not to exceed the rates set forth in Attachment E, Fee Schedule) by the Engineer in performing the work to the date of default; (2) the amount of work required which was satisfactorily completed to date of default; (3) the value of the work which is usable to the State; (4) the cost to the State of employing another firm to complete the required work; (5) the time required to employ another firm to complete the work; and (6) other factors which affect the value to the State of the work performed.

D. Calculation of Payments. The State shall use the fee schedule set forth in Attachment E to the contract (Fee Schedule) in determining the value of the work performed up to the time of termination. In the case of partially completed engineering services, eligible costs will be calculated as set forth in Attachment E, Fee Schedule. The sum of the provisional overhead percentage rate for payroll additives and for general and administrative overhead costs during the years in which work was performed shall be used to calculate partial payments. Any portion of the fixed fee not previously paid in the partial payments shall not be included in the final payment.

E. Excusable Delays. Except with respect to defaults of subproviders, the Engineer shall not be in default by reason of any failure in performance of this contract in accordance with its terms (including any failure to progress in the performance of the work) if such failure arises out of causes beyond the control and without the default or negligence of the Engineer. Such causes may include, but are not restricted to, acts of God or the public enemy, acts of the Government in either its sovereign or contractual capacity, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and unusually severe weather.

F. Surviving Requirements. The termination of this contract and payment of an amount in settlement as prescribed above shall extinguish the rights, duties, and obligations of the State and the Engineer under this contract, except for those provisions that establish responsibilities that extend beyond the contract period.

G. Payment of Additional Costs. If termination of this contract is due to the failure of the Engineer to fulfill its contract obligations, the State may take over the project and prosecute the work to completion, and the Engineer shall be liable to the State for any additional cost to the State.

ARTICLE 16. COMPLIANCE WITH LAWS

The Engineer shall comply with all applicable federal, state and local laws, statutes, codes, ordinances, rules

and regulations, and the orders and decrees of any court, or administrative bodies or tribunals in any manner affecting the performance of this contract, including, without limitation, worker's compensation laws, minimum and maximum salary and wage statutes and regulations, nondiscrimination, and licensing laws and regulations. When required, the Engineer shall furnish the State with satisfactory proof of its compliance therewith.

ARTICLE 17. INDEMNIFICATION

A. Errors, Omissions, Negligent Acts. The Engineer shall save harmless the State and its officers and employees from all claims and liability due to activities of itself, its agents, or employees, performed under this contract and which are caused by or result from error, omission, or negligent act of the Engineer or of any person employed by the Engineer.

B. Attorney Fees. The Engineer shall also save harmless the State from any and all expense, including, but not limited to, attorney fees which may be incurred by the State in litigation or otherwise resisting said claim or liabilities which may be imposed on the State as a result of such activities by the Engineer, its agents, or employees.

ARTICLE 18. ENGINEER'S RESPONSIBILITY

A. Accuracy. The Engineer shall be responsible for the accuracy of work and shall promptly make necessary revisions or corrections resulting from its errors, omissions, or negligent acts without compensation.

B. Errors and Omissions. The Engineer's Responsibility for all questions arising from design errors or omissions will be determined by the State. All decisions shall be in accordance with the State's "Consultant Errors & Omissions Correction and Collection Procedures" and Texas Government Code §2252.905. The Engineer will not be relieved of the responsibility for subsequent correction of any such errors or omissions or for clarification of any ambiguities until after the construction phase of the project has been completed.

C. Seal. The responsible Engineer shall sign, seal and date all appropriate engineering submissions to the State in accordance with the Texas Engineering Practice Act and the rules of the Texas Board of Professional Engineers.

D. Resealing of Documents. Once the work has been sealed and accepted by the State, the State, as the owner, will notify the party to this contract, in writing, of the possibility that a State engineer, as a second engineer, may find it necessary to alter, complete, correct, revise or add to the work. If necessary, the second engineer will affix his seal to any work altered, completed, corrected, revised or added. The second engineer will then become responsible for any alterations, additions or deletions to the original design including any effect or impacts of those changes on the original engineer's design.

ARTICLE 19. NONCOLLUSION

A. Warranty. The Engineer warrants that it has not employed or retained any company or person, other than a bona fide employee working solely for the Engineer, to solicit or secure this contract and that it has not paid or agreed to pay any company or engineer any fee, commission, percentage, brokerage fee, gifts, or any other consideration, contingent upon or resulting from the award or making of this contract.

B. Liability. For breach or violation of this warranty, the State shall have the right to annul this contract without liability or, in its discretion, to deduct from the contract price or compensation, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gift or contingent fee.

ARTICLE 20. INSURANCE

The Engineer certifies that it has insurance on file with Contract Services of the Texas Department of Transportation in the amount specified on Texas Department of Transportation Form 1560-CS Certificate of Insurance, as required by the State. No other proof of insurance is acceptable to the State. The Engineer certifies that it will keep current insurance on file with that office for the duration of the contract period. If insurance lapses during the contract period, the Engineer must stop work until a new certificate of insurance is provided.

ARTICLE 21. GRATUITIES

A. Employees Not to Benefit. Texas Transportation Commission policy mandates that employees of the

Texas Department of Transportation shall not accept any benefit, gift or favor from any person doing business with or who reasonably speaking may do business with the State under this contract. The only exceptions allowed are ordinary business lunches and items that have received the advance written approval of the Executive Director of the Texas Department of Transportation.

B. Liability. Any person doing business with or who reasonably speaking may do business with the State under this contract may not make any offer of benefits, gifts or favors to department employees, except as mentioned above. Failure on the part of the Engineer to adhere to this policy may result in the termination of this contract.

ARTICLE 22. DISADVANTAGED BUSINESS ENTERPRISE OR HISTORICALLY UNDERUTILIZED BUSINESS REQUIREMENTS

The Engineer agrees to comply with the requirements set forth in Attachment H, Disadvantaged Business Enterprise or Historically Underutilized Business Subcontracting Plan Requirements with an assigned goal or a zero goal, as determined by the State.

ARTICLE 23. MAINTENANCE, RETENTION AND AUDIT OF RECORDS

A. Retention Period. The Engineer shall maintain all books, documents, papers, accounting records and other evidence pertaining to costs incurred and services provided (hereinafter called the Records). The Engineer shall make the records available at its office during the contract period and for seven (7) years from the date of final payment under this contract, until completion of all audits, or until pending litigation has been completely and fully resolved, whichever occurs last.

B. Availability. The State or any of its duly authorized representatives, the Federal Highway Administration, the United States Department of Transportation, Office of Inspector General, and the Comptroller General shall have access to the Engineer's Records which are directly pertinent to this contract for the purpose of making audits, examinations, excerpts and transcriptions.

ARTICLE 24. NEPOTISM DISCLOSURE

A. In this section the term "relative" means:

- (1) a person's great grandparent, grandparent, parent, aunt or uncle, sibling, niece or nephew, spouse, child, grandchild, or great grandchild, or
- (2) the grandparent, parent, sibling, child, or grandchild of the person's spouse.

B. A notification required by this section shall be submitted in writing to the person designated to receive official notices under this contract and by first-class mail addressed to Contract Services Office, Texas Department of Transportation, 125 East 11th Street, Austin Texas 78701. The notice shall specify the Engineer's firm name, the name of the person who submitted the notification, the contract number, the district, division, or office of TxDOT that is principally responsible for the contract, the name of the relevant Engineer employee, the expected role of the Engineer employee on the project, the name of the TxDOT employee who is a relative of the Engineer employee, the title of the TxDOT employee, the work location of the TxDOT employee, and the nature of the relationship.

C. By executing this contract, the Engineer is certifying that the Engineer does not have any knowledge that any of its employees or of any employees of a subcontractor who are expected to work under this contract have a relative that is employed by TxDOT unless the Engineer has notified TxDOT of each instance as required by subsection (b).

D. If the Engineer learns at any time that any of its employees or that any of the employees of a subcontractor who are performing work under this contract have a relative who is employed by TxDOT, the Engineer shall notify TxDOT under subsection (b) of each instance within thirty days of obtaining that knowledge.

E. If the Engineer violates this section, TxDOT may terminate the contract immediately for cause, may impose any sanction permitted by law, and may pursue any other remedy permitted by law.

ARTICLE 25. CIVIL RIGHTS COMPLIANCE

(1) Compliance with Regulations: The Engineer shall comply with the regulations of the Department of Transportation, Title 49, Code of Federal Regulations, Parts 21, 25, 27 and 28 as they relate to nondiscrimination; also Executive Order 11246 titled Equal Employment Opportunity as amended by Executive Order 11375.

(2) Nondiscrimination: The Engineer, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, sex, or national origin in the selection and retention of subcontractors, including procurement of materials and leases of equipment.

(3) Solicitations for Subcontracts, Including Procurement of Materials and Equipment: In all solicitations either by competitive bidding or negotiation made by the Engineer for work to be performed under a subcontract, including procurement of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the Engineer of the Engineer's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, sex, or national origin.

(4) Information and Reports: The Engineer shall provide all information and reports required by the Regulations, or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information, and facilities as may be determined by the Texas Department of Transportation or the Federal Highway Administration to be pertinent to ascertain compliance with such Regulations or directives. Where any information required of the Engineer is in the exclusive possession of another who fails or refuses to furnish this information, the Engineer shall so certify to the Texas Department of Transportation or the Federal Highway Administration, as appropriate, and shall set forth what efforts it has made to obtain the information.

(5) Sanctions for Noncompliance: In the event of the Engineer's noncompliance with the nondiscrimination provisions of this contract, the Texas Department of Transportation shall impose such contract sanctions as it or the Federal Highway Administration may determine to be appropriate, including, but not limited to:

- (a) withholding of payments to the Engineer under the contract until the Engineer complies and/or
- (b) cancellation, termination, or suspension of the contract, in whole or in part.

(6) Incorporation of Provisions: The Engineer shall include the provisions of paragraphs (1) through (5) in every subcontract, including procurement of materials and leases of equipment, unless exempt by the Regulations or directives issued pursuant thereto. The Engineer shall take such action with respect to any subcontract or procurement as the Texas Department of Transportation or the Federal Highway Administration may direct as a means of enforcing such provisions including sanctions for noncompliance provided, however, that in the event an Engineer becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the Engineer may request the Texas Department of Transportation to enter into such litigation to protect the interests of the State; and, in addition, the Engineer may request the United States to enter into such litigation to protect the interests of the United States.

ARTICLE 26. PATENT RIGHTS

The State and the U. S. Department of Transportation shall have the royalty free, nonexclusive and irrevocable right to use and to authorize others to use any patents developed by the Engineer under this contract.

ARTICLE 27. COMPUTER GRAPHICS FILES

The Engineer agrees to comply with Attachment G, Computer Graphics Files for Document and Information Exchange, if determined by the State to be applicable to this contract.

ARTICLE 28. CHILD SUPPORT CERTIFICATION

Under Section 231.006, Texas Family Code, the Engineer certifies that the individual or business entity named in this contract, bid, or application is not ineligible to receive the specified grant, loan, or payment and acknowledges that this contract may be terminated and payment may be withheld if this certification is inaccurate. If the above certification is shown to be false, the Engineer is liable to the state for attorney's fees, the cost necessary to complete the contract, including the cost of advertising and awarding a second contract, and any other damages provided by law or the contract. A child support obligor or business entity ineligible to receive payments because of a payment delinquency of more than thirty (30) days remains ineligible until: all

arrears have been paid; the obligor is in compliance with a written repayment agreement or court order as to any existing delinquency; or the court of continuing jurisdiction over the child support order has granted the obligor an exemption from Subsection (a) of Section 231.006, Texas Family Code, as part of a court-supervised effort to improve earnings and child support payments.

ARTICLE 29. DISPUTES

A. Disputes Not Related to Contract Services. The Engineer shall be responsible for the settlement of all contractual and administrative issues arising out of any procurement made by the Engineer in support of the services authorized herein.

B. Disputes Concerning Work or Cost. Any dispute concerning the work hereunder or additional costs, or any non-procurement issues shall be settled in accordance with 43 Texas Administrative Code §9.2.

ARTICLE 30. SUCCESSORS AND ASSIGNS

The Engineer and the State do each hereby bind themselves, their successors, executors, administrators and assigns to each other party of this agreement and to the successors, executors, administrators and assigns of such other party in respect to all covenants of this contract. The Engineer shall not assign, subcontract or transfer its interest in this contract without the prior written consent of the State.

ARTICLE 31. SEVERABILITY

In the event any one or more of the provisions contained in this contract shall for any reason, be held to be invalid, illegal, or unenforceable in any respect, such invalidity, illegality, or unenforceability shall not affect any other provision thereof and this contract shall be construed as if such invalid, illegal, or unenforceable provision had never been contained herein.

ARTICLE 32. PRIOR CONTRACTS SUPERSEDED

This contract constitutes the sole agreement of the parties hereto for the services authorized herein and supersedes any prior understandings or written or oral contracts between the parties respecting the subject matter defined herein.

ARTICLE 33. CONFLICT OF INTEREST

A. Representation by Engineer.

The Engineer represents that its firm has no conflict of interest that would in any way interfere with its or its employees' performance of services for the department or which in any way conflicts with the interests of the department. The Engineer further certifies that this agreement is not barred because of a conflict of interest pursuant to Texas Government Code, Section 2261.252, between it and the State. Specifically, the Engineer certifies that none of the following individuals, nor any of their family members within the second degree of affinity or consanguinity, owns 1% or more interest, or has a financial interest as defined under Texas Government Code, Section 2261.252(b), in the Engineer: any member of the Texas Transportation Commission, TxDOT's Executive Director, General Counsel, Chief of Procurement and Field Support Operations, Director of Procurement, or Director of Contract Services. The firm shall exercise reasonable care and diligence to prevent any actions or conditions that could result in a conflict with the department's interests.

B. Certification Status. The Engineer certifies that it is not:

1. a person required to register as a lobbyist under Chapter 305, Government Code;
2. a public relations firm; or
3. a government consultant.

C. Environmental Disclosure. If the Engineer will prepare an environmental impact statement or an environmental assessment under this contract, the Engineer certifies by executing this contract that it has no financial or other interest in the outcome of the project on which the environmental impact statement or environmental assessment is prepared.

D. Restrictions on Testing. If the Engineer will perform commercial laboratory testing under this contract, on any project the Engineer may not perform more than one of the following types of testing:

1. verification testing;

2. quality control testing; or
3. independent assurance testing

ARTICLE 34. OFFICE OF MANAGEMENT AND BUDGET (OMB) AUDIT REQUIREMENTS

The parties shall comply with the requirements of the Single Audit Act of 1984, P.L. 98-502, ensuring that the single audit report includes the coverage stipulated in 2 CFR 200.

ARTICLE 35. DEBARMENT CERTIFICATIONS

The parties are prohibited from making any award at any tier to any party that is debarred or suspended or otherwise excluded from or ineligible for participation in Federal Assistance Programs under Executive Order 12549, "Debarment and Suspension." By executing this agreement, the Engineer certifies that it is not currently debarred, suspended, or otherwise excluded from or ineligible for participation in Federal Assistance Programs under Executive Order 12549. The parties to this contract shall require any party to a subcontract or purchase order awarded under this contract to certify its eligibility to receive Federal funds and, when requested by the State, to furnish a copy of the certification.

ARTICLE 36. E-VERIFY CERTIFICATION

Pursuant to Executive Order RP-80, Engineer certifies and ensures that for all contracts for services, Engineer shall, to the extent permitted by law, utilize the United States Department of Homeland Security's E-Verify system during the term of this agreement to determine the eligibility of:

1. All persons employed by Engineer during the term of this agreement to perform duties within the State of Texas; and
2. All persons, including subcontractors, assigned by Engineer to perform work pursuant to this agreement.

Violation of this provision constitutes a material breach of this agreement.

ARTICLE 37. RESTRICTIONS ON EMPLOYMENT OF FORMER STATE OFFICER OR EMPLOYEE

The Engineer shall not hire a former state officer or employee of a state agency who, during the period of state service or employment, participated on behalf of the state agency in this agreement's procurement or its negotiation until after the second anniversary of the date of the officer's or employee's service or employment with the state agency ceased.

ATTACHMENT B
SERVICES TO BE PROVIDED BY THE STATE

The State will provide the following:

- A. Name, address and phone number of the State's project manager.
- B. Any records available which would assist in the completion of the environmental services.
- C. Review of recommendations offered by the Engineer and approve or reject any or all work performed under this contract.
- D. Review of progress of work and final acceptance of all documents.
- E. Processing of all periodic payment requests submitted by Engineer.
- F. Submittal of documentation to regulatory agencies for review and comment when specified.
- G. All comments regarding the review of the environmental services completed.
- H. Assistance in the coordination and scheduling of site visits.
- I. Review and approve typical roadway and bridge cross sections created by the Engineer.
- J. Provide pavement design to be used for cost estimation purposes.
- K. Provide existing traffic count data, as applicable.
- L. Provide available planimetric mapping, aerial photography and Digital Terrain Model (DTM) for the corridor.
- M. Provide Crash Data for most recent 3-year period from Crash Records Information System (CRIS) database, as applicable.
- N. Provide available horizontal control points, benchmark elevations and descriptions for vertical control in the project area.
- O. Make available existing Right-of-Way (ROW) maps of state highway facilities in the project corridor.
- P. Make available interface data for any projects adjacent to the project corridor.
- Q. Provide current average bid prices for construction, maintenance, and operation costs.
- R. Assist as necessary in obtaining the required data and information from other local, regional, state, and federal agencies.
- S. Provide the Engineer with timely reviews in accordance with Exhibit C, "Work Schedule" of the Work Authorization and decisions necessary for the Engineer to maintain the project work schedule.

- T. Provide the Engineer with examples of acceptable format for the deliverables required by the work authorizations.
- U. Provide the Engineer with the current version of all State's Guidelines for preparation of environmental documents, air quality analysis, and noise analysis. Make available versions of "recommended text" for air, noise, or other studies that the State desires standard wording to be used.
- V. Provide the Potential Archeological Liability Map (PALM) of the project area, if applicable.
- W. Distribute environmental document and schematic layout to the appropriate agencies and the public.
- X. Right of entry from public or private land owners to allow environmental services to be performed. Right of entry permission shall be written and signed by the land owner. Letters or other materials seeking right of entry shall contain explicit reference to the kinds of activities for which right of entry is requested and an indication of the impacts (if any) that will result from performance of environmental services, if applicable.
- Y. The State will provide an estimate of the cost for any required ROW and associated improvements.
- Z. Plans, accident data, speed zone strip maps, and any documentation which would assist in the completion of the project
- AA. Review and implement timing plans in the field after the technical review meeting. Programming of the signal controllers to implement the timing plans will normally be the responsibility of the Engineer.

Resource Information

A. Agencies.

1. AASHTO – American Association of State Highway and Transportation Officials
2. BEG - Bureau of Economic Geology, University of Texas at Austin
3. CEQ - Council on Environmental Quality
4. ENV - Environmental Affairs Division of the Texas Department of Transportation
5. District - One of the 25 geographical districts into which the Texas Department of Transportation is divided.

6. FEMA - Federal Emergency Management Agency
7. FHWA - Federal Highway Administration
8. IBWC – International Boundary and Water Commission
9. MPO - Metropolitan Planning Organization
10. NRCS - Natural Resource Conservation Service (formerly Soil Conservation Service)
11. SHPO - State Historic Preservation Office
12. State – Texas Department of Transportation acting on behalf of the State of Texas
13. TARL – Texas Archeological Research Laboratory
14. THC - Texas Historical Commission
15. TCEQ - Texas Commission on Environmental Quality (formerly TNRCC)
16. TPWD - Texas Parks and Wildlife Department
17. TxDOT - Texas Department of Transportation
18. USACE – United States Army Corps of Engineers
19. USCG – United States Coast Guard
20. USEPA – United States Environmental Protection Agency
21. USFWS – United States Fish and Wildlife Service
22. USGS – United States Geological Survey
23. UTM – Universal Transverse Mercator

B. Environmental Terms.

1. APE - Area of Potential Effects
2. Archeological Historic Property - an archeological site eligible for inclusion in the National Register of Historic Places (36 CFR 60) or for designation as a State Archeological Landmark (SAL) (TAC, Title 13, Part 2, Chapter 26).
3. CE – Categorical Exclusion
4. CFR – Code of Federal Regulations
5. CSJ – Control Section Job
6. Deliverables – Reports for environmental services
7. EA – Environmental Assessment
8. Environmental Services – environmental documents, studies, research, permit

applications, public involvement, training and other activities for completion of an environmental document.

9. EPIC – Environmental Permits Issues and Commitments
10. FHWA Technical Advisory T 6640.8A (1987) – FHWA Format Guidance
11. FONSI - Finding of No Significant Impact (23 CFR 771 and TAC, Title 43)
12. HABS – Historic American Buildings Survey
13. HAER – Historic American Engineering Record
14. Historic-age resource - a building, structure, object or non-archeological site (defined in accordance with 36 CFR 60) that is at least 50 years old at the time of a transportation project's letting.
15. Historic Property - a building, structure, object or non-archeological site eligible for inclusion in the National Register of Historic Places (36 CFR 60).
16. IP – Individual Permit
17. ISA – Initial Site Assessment
18. MSAT – Mobile Source Air Toxics
19. NEPA – National Environmental Policy Act of 1969
20. NCHRP – National Cooperative Highway Research Program
21. NHPA – National Historic Preservation Act
22. NRHP – National Register of Historic Places
23. NRI – Nationwide River Inventory
24. NWP – Nation Wide Permit
25. PCE – Programmatic Categorical Exclusion
26. PCN - Pre-Construction Notification
27. Programmatic Section 4(f) Evaluation – A type of Section 4(f) evaluation that may be prepared for projects with minor impacts on areas protected by Section 4(f) s provided that the project meets FHWA's programmatic thresholds.
28. SAL – State Archeological Landmark
29. Project Area - a geographic area designated for performance of specified analyses, such as wetland or archeological studies.
30. Section 4(f) – a special provision of the Department of Transportation Act of 1966, codified as 49 USC Section 303

- 31. Section 4(f) Evaluation – an evaluation prepared when a project proposed to use resources from any significant publicly owned public parks, recreation areas, or wildlife and waterfowl refuges and any land from an historic sites of national, state or local significance provided that the project meets FHWA's programmatic thresholds.
- 32. SOU – Standards of Uniformity
- 33. Study Area - the geographic area to be discussed in an environmental document.
- 34. TAC – Texas Administrative Code
- 35. TPDES – Texas Pollutant Discharge Elimination System
- 36. Transportation Activity - a construction or other project performed by the State or under its jurisdiction
- 37. Transportation Project - The planning, construction, or reconstruction of a transportation facility that the department has the legal authority to plan, construct, or reconstruct, including but not limited to, a public road or highway, bridge, ferry, transit facility, or high occupancy vehicle lane.
- 38. TXNDD – Texas Natural Diversity Database
- 39. USC – United States Code
- 40. Wetland Determination – Preliminary study to determine whether a wetland is present.
- 41. UTM – Universal Transverse Mercator
- 42. Wetland Delineation – Demarcation of the boundaries of a wetland in accordance with the most current version of the USACE Wetland Delineation Manual (Technical Report Y-87-1).
- 43. Waters of the U.S. – Jurisdictional limits of the U.S. Army Corps of Engineers under the Clean Waters Act, as defined in 33 CFR 328.

ATTACHMENT C
SERVICES TO BE PROVIDED BY THE ENGINEER

The work to be performed by the Engineer shall consist of providing preliminary engineering services for development of a schematic design layout, environmental studies in support of the schematic work, public involvement, permit procurement, data collection analysis, mitigation and remediation, monitoring, traffic engineering and operations including traffic simulations and 3-D modeling, and surveying and mapping for various highway projects located within the State of Texas.

The Engineer shall complete the services to be provided by the Engineer according to the milestone work schedule established in the work authorization. The Engineer shall submit a written progress report to the State monthly indicating the actual work accomplished during the month, scheduled work to be accomplished for that month, and the estimated work to be accomplished for the coming month. The progress report will use a bar chart diagram to indicate the percentage complete of each task shown on the previous report and the percentage complete of each tasks. The Engineer is required to meet with the designated State project manager or environmental coordinator on a monthly basis for progress tracking purposes unless prior agreement is made with State not to hold a meeting in any given month. The Engineer shall submit minutes of the meeting summarizing the events of the meeting within seven calendar days after each meeting.

The Engineer shall prepare a project work schedule. The work schedule must incorporate an allocation of time for stage reviews of the developing schematic design and the environmental documents by State personnel. The Engineer shall present the work schedule to the State personnel for review and acceptance, and provide assistance in interpreting the proposed work schedule.

Function Code 102 (110) – Route and Design Studies

The Engineer shall prepare an alignment and proposed roadway schematic layout to include projected traffic volumes, existing and proposed typical sections. The Engineer shall furnish Microsoft Office and Microstation V8i-Geopak computer generated media containing the roadway schematic layout to the State. All supporting attachments and exhibits shall accompany the schematic layout. All Microsoft Office and Microstation V8i-Geopak computer generated files containing the roadway schematic layout shall be compatible with the software used by the State.

The Engineer shall obtain, review, and evaluate existing and twenty-year projected traffic data for use

in the preparation of the schematic design layout. The data shall be utilized in accordance with the requirements for schematic development and consistent with the policies of the State.

The Engineer shall prepare preliminary drawings to identify any potential adverse impacts within the project corridor. Identification of all existing and proposed utilities (public and private), structures, burial grounds, neighborhood communities, historical landmarks, and undeveloped areas is required. Any potential utility conflicts and structural impediments must be identified as such. The Engineer shall propose alternative alignments which would avoid or minimize displacements and damages, and prepare any additional attachments or exhibits required illustrating a preferred alternative alignment. The Engineer shall render assistance to the State for agency meetings as necessary during the development of the schematic design as requested by the State. The Engineer shall also render assistance to the State for public meetings and a public hearing if requested.

An itemization of the schematic design and engineering work activity to be performed under this contract is detailed below. All designs shall be prepared in accordance with the latest version of: TxDOT Roadway Design Manual, TxDOT Project Development Process Manual, AASHTO Policy on Geometric Design of Highways and Streets, TxDOT Standard Specifications for Construction of Highways, Streets, and Bridges, TxDOT Traffic Operations Manual on Highway Operations, and Highway Capacity Manual - Transportation Research Board.

The schematic layout will adhere to a design scale of 1 in. = 100 ft. The schematic layout, exhibits, and attachments will be developed in English units. All Microsoft Office and Microstation V8i - Geopak computer graphic files furnished to the State must be submitted in electronic format by means of a CD media that will be compatible to the State. Schematics will follow the State and Federal Highway Administration (FHWA) standards, the schematic will also follow the CADD standards used by the State and shall be submitted as an original document, accompanied with an original Microstation V8i formatted graphics file. Final copies of the schematic design shall be signed by a professional engineer licensed in the State of Texas.

Schematic Design Work Outline:

A. Develop Base Maps

The base maps to be used for the analysis and proposed schematic layout shall be developed

by the Engineer from existing construction and right of way (ROW) plans as available. The Engineer shall re-establish the existing centerline horizontal alignments for all roadways, identify existing ROW, property owners and the approximate location of major utilities in the preparation of base maps.

B. Planimetrics and Aerial Mapping

Planimetrics, Digital Terrain Modeling (DTM), and aerial photographs shall be furnished to the Engineer by the State, if available.

C. Analyze Existing Conditions

Using collected data and base maps, the Engineer shall develop an overall analysis of the existing conditions in order to develop the schematic design. The analysis shall include, but not be limited to the following:

1. ROW determination
2. Horizontal alignment
3. Profile grades
4. Pavement cross slopes and pavement type
5. Soil Exploration
6. Geotechnical Testing
7. Highway - Rail Grade Crossing Studies (Delete if not applicable)
8. Intersection design and analysis
9. Sight distance
10. Roadside signing
11. Level-of-service
12. Locations of critical constraints
13. Drainage
14. Traffic control and construction phasing sequence

D. Origin and Destination Study

The Engineer shall conduct origin and destination studies for designated locations to obtain information on existing travel practices for improving traffic operations.

The Engineer shall perform the following:

Provide documentation as to where motorists begin and end their trips.

1. Provide documentation on the type of vehicle used to travel (e.g., automobile, public transit, truck, etc.).
2. Provide documentation when motorists travel (time of day).
3. Provide documentation why motorists travel (e.g., work, shop, eat, etc.).
4. Provide documentation where motorists park their vehicles.
5. Prepare site map of the area where the study is requested.
6. Analyze all collected documentation and prepare to submit two (2) reports, one (1) bound set and one (1) unbound set, to the State, which summarizes the findings.

E. Travel Time and Delay Study

The Engineer shall conduct travel time and delay studies for designated locations to evaluate existing levels of service and to make recommendations for improving flow and operations.

The Engineer shall perform the following:

1. Perform a series of test vehicle runs through the section of roadway to obtain representative travel times. The floating car average speed techniques (or both) may be used to obtain travel time.
2. Perform the moving-vehicle method of volume counting to obtain travel times by following test vehicle procedures and computing the results.
3. Perform the license plate method by stationing one or more observers at each entrance and exit of the study section to record the time and license number of each vehicle as it passes the observation point.
4. Perform the direct observation and timing method if the observer can see both the entrance and exit points.
5. Perform the interview technique method.

F. Schematic Alternatives

The Engineer shall identify and analyze schematic alternatives to minimize potential adverse impacts, major utility conflicts, structural impediments, or exceptions to the State or FHWA design criteria.

G. Deliverable Schematic

The Engineer shall consider the following in the analysis to optimize the design:

1. The most efficient use of the allocated ROW
2. Roadway and intersection geometry
3. Sight distance
4. Level-of-service and excessive queues and delay
5. Traffic and signal operations
6. Construction costs
7. Construction sequencing and traffic control during construction
8. Roadside safety appurtenances
9. Large guide signage
10. Interface with existing High Occupancy Vehicle (HOV) Lane, Managed Lanes, and park-and-ride facilities

H. Project Management and Coordination

The Engineer shall:

1. Direct and coordinate the various elements and activities associated with developing the design schematic.
2. Prepare the detailed graphic Project Work Schedule indicating tasks, critical dates, milestones, deliverables and State review requirements. The Project Work Schedule will depict the order of the various tasks, milestones, and deliverables. The Engineer shall review and provide comments on its elements of the schedule to the State.
3. Submit written monthly Progress Reports to the State.
4. Prepare subcontracts for subconsultants, direct and monitor subconsultants activities, and review subconsultant work and invoices.
5. Provide ongoing quality assurance and quality control to ensure completeness of product and compliance with the State procedures.
6. Prepare and submit invoices.

I. Data Collection

The Engineer shall conduct field reconnaissance and collect data as necessary to complete the schematic design. Data shall include the following information. Items "1" to "9" will be obtained from the State, if available, while items "10" to "13" will be obtained from other agencies as required.

1. Available Corridor Major Investment Studies
2. Design data from record drawings of existing and proposed facilities
3. Existing and future design year traffic data
4. Roadway inventory information, including the number of lanes, speed limits, pavement widths and rating, bridge widths and ratings, and ROW widths
5. Aerial photos, planimetric mapping, and DTM
6. Environmental Data
7. Previously prepared drainage studies
8. Crash Data for most recent 3-year period from Crash Records Information System (CRIS) database
9. Traffic Signal Timings
10. Adopted land use maps and plans as available
11. Federal Emergency Management Agency (FEMA) Flood Boundary Maps
12. Public and private utility information
13. Traffic Signal Timings (from other agencies, as required)

J. Preliminary Design Conference

The Engineer shall prepare and submit a preliminary Design Summary Report (DSR) to the State for review and approval and shall attend an initial Kick-Off Meeting to establish and agree on fundamental aspects and concepts and to establish the basic features and design criteria for the project. This meeting will be coordinated with any adjacent projects to ensure continuity.

K. Schematic Design – General Tasks

1. ROW/Property Base Map

The Engineer shall obtain information on existing ROW and property information from

as-built plans, ROW maps, and tax records and prepare a base map depicting the information.

2. Utility Base Map

The Engineer shall obtain information on existing utilities from utility owners and shall conduct investigations to identify and evaluate all known existing and proposed public and private utilities. The Engineer shall identify potential conflicts and attempt to minimize the potential adverse utility impacts in the preparation of the schematic design. The Engineer shall prepare a base map depicting the utility locations.

3. Typical Sections

The Engineer shall develop both existing and proposed typical sections that depict the number and type of lanes, shoulders, median width, curb offsets, cross slope, border width, clear zone widths, and ROW limits.

4. Environmental Constraints

The Engineer shall consider impacts to environmentally sensitive sites (as identified by the State and provided to the Engineer) during the schematic design process. The environmental sensitive sites may include historic structures, cemeteries, residential areas, historical landmarks, and farmland.

5. Drainage

The Engineer shall use data from as-built plans and FEMA maps to locate drainage out fall(s) and to determine existing storm sewer and culvert sizes, design flows, and water surface elevations for use in the design of roadway geometry. The Engineer shall conduct a Preliminary Drainage Study to determine and evaluate the adequacy of the ROW needed to accommodate the proposed roadway and drainage system. The drainage study shall identify the impacts to abutting properties and the 100-year floodplain due to proposed highway improvements, identify the water surface elevations for the 2, 5, 10, 25, 50 and 100 year storm events, identify and locate outfalls, drainage outfall descriptions, provide overall drainage area map, sub-drainage area map, storm water detention facilities, and provide a drainage study report identifying the results of the study. The drainage report, signed and sealed by a professional engineer, shall include applicable hydrologic and hydraulic models such as HEC-1 and HEC-2, HEC-RAS, HEC-HMS, XP-SWMM, and other applicable models. The Engineer shall not evaluate the adequacy of the existing drainage structures.

6. ROW Requirements

The Engineer shall determine the ROW requirements based on the proposed alignment, typical sections, access control, terrain, construction requirements, drainage, clear zone, maintenance, Intelligent Transportation System (ITS) and environmental mitigation requirements.

7. Construction Sequence

The Engineer shall consider the requirements for construction and traffic control throughout the development of schematic design to ensure that the proposed design can be constructed.

8. Design Exceptions

The Engineer shall identify design exceptions and waivers, and shall document the necessity for each design exception or waiver.

9. Traffic and Operational Analysis

The Engineer shall review and analyze traffic data (including percent trucks, design hourly volume, and directional distribution), existing roadway features (including ramp locations, weaving sections, number of lanes, offset to obstructions, lane widths, frontage road operations, and intersection operation and geometry), traffic flow patterns, accident patterns and frequencies, and transit and traffic operations. A detailed CORSIM (or PASSER, HCS, VISSIM and SYNCRO) analysis will be performed for the current year using current traffic and geometric conditions and for the design year using traffic projections and proposed geometric designs to compare different geometric alternatives and ramp patterns. Results of this analysis shall be incorporated into the schematic design.

10. Bicycle and Pedestrian Accommodations

The Engineer shall comply with the federal policy statement on Bicycle and Pedestrian Accommodations Regulations and Recommendations by United States Department of Transportation (USDOT). This policy encourages the incorporation of safe and convenient walking and bicycling facilities into transportation projects. The inclusion of bicycle and pedestrian facilities shall be considered when the project is scoped. Public input when applicable, as well as local city and metropolitan planning organization for bicycle and pedestrian plans shall be considered.

11. Interstate Access Justification

The Engineer shall prepare an Interstate Access Justification report in accordance with established FHWA procedures to document proposed changes in access to interstate highways. The request shall include an introduction that describes the proposed project along with a statement of need. The request shall address at a minimum, the eight policy requirements outlined in the FHWA policy. The access request shall provide an explanation of how the request satisfies each of the eight points in the policy requirements. Supporting analysis to illustrate how those requirements are met shall be included.

12. High Occupancy Vehicle and Managed Lanes

The Engineer shall address High Occupancy Vehicle lane, Managed Lanes and other special use lanes or public transportation elements shall be addressed and considered within the context of the mainlane and interchange design.

L. Conceptual Design Schematics

The Engineer shall develop conceptual design schematics in MicroStation format to evaluate various methods of handling traffic while providing access in key areas. It is anticipated that a single design alternative that optimizes traffic flow and access shall be produced. The conceptual schematics will be plan view only. Profile work will be done only to the extent necessary to lay out the proper horizontal geometry.

The schematics shall contain the following design elements:

1. Mainlane roadway alignment
2. Pavement edges, face of curbs and shoulder lines
3. Typical sections of existing and proposed roadways
4. Proposed structure locations
5. Preliminary ROW requirements and control-of-access locations
6. Direction of traffic flow and the number of lanes on all roadways
7. Existing and projected traffic volumes

M. Geometric Design Schematics

The Engineer shall develop geometric design schematics based on the conceptual schematics after the basic layout, lane arrangement, and ROW requirements depicted on the conceptual schematics as approved. The State may require this task be performed using OpenRoads Technology.

The geometric schematic plan view shall contain the following design elements:

1. Geopak calculated roadway alignments for mainlanes, ramps, direct connectors, bridges, HOV lane, managed lanes, frontage roads and cross streets at grade separations and horizontal curve data shown in tabular format
2. Pavement edges, curb lines, sidewalks for all roadway improvements
3. Typical sections of existing and proposed roadways
4. Proposed structure locations, bridge layouts including abutment, bent and rail locations
5. Existing and proposed major utilities
6. Existing property lines and respective property ownership information
7. ROW requirements adequate for preparation of ROW maps
8. Control-of-access limits
9. Existing and projected traffic volumes
10. Location and text of the proposed mainlane guide signs and the preliminary locations for changeable message signs
11. Lane lines, shoulder lines, and direction of traffic flow arrows indicating the number of lanes on all roadways

The geometric schematic profile view shall contain the following design elements:

1. Calculated profile grade and vertical curve data including "K" values for the mainlanes
2. Existing ground line profiles along the mainlanes
3. Grade separations and overpasses
4. Calculated vertical clearances at grade separations and overpasses

The calculated profile grade for frontage roads, connectors, ramps and cross streets will be shown on separate Supplemental Profile rolls.

N. Cross-Sections

The Engineer shall use Geopak to generate preliminary cross-sections every 100 feet in conjunction with the Geometric Schematic. The Engineer shall determine earthwork volumes for use in the cost estimate, and shall prepare roll plots of the cross-sections.

O. Renderings and Traffic Simulation

The Engineer shall develop renderings, three-dimensional (3D) models, illustrations, and animations as a means of expression and understanding for what the owner of a project envisions and what the public perceives. In support of the Public Outreach effort, reasonable Build Alternatives will be chosen by the State to be carried forward into creating one rendering and one traffic animation for each of the various alternatives. A 3D model shall be created for the reasonable Build Alternatives from supplied: horizontal and vertical alignments, existing and proposed digital terrain models (DTMs), proposed typical sections, traffic counts, and ground photography.

The animations and renderings shall give the public and stakeholders a clear awareness and appreciation for the reduction of traffic congestion and how traffic will flow into and out of the project area.

P. Preliminary Construction Sequence

The Engineer shall prepare a Preliminary Construction Sequence Layout in conjunction with the Geometric Schematic depicting the phasing and traffic detours anticipated to construct the proposed design.

Q. Preliminary Cost Estimate

The Engineer shall prepare a preliminary cost estimate for the project, including the costs of construction and eligible utility adjustments. Current State unit bid prices will be used in preparation of the estimate.

R. Engineering Summary Report

The Engineer shall prepare a report to summarize the design criteria, traffic analysis, preliminary cost estimate and basis of estimate, construction sequence description, and utility

conflict issues.

S. Agency Coordination and Public Involvement

1. The Engineer shall assist the State in conducting meetings with various agencies to discuss and review the schematic design. The Engineer shall document and respond to issues related to the schematic design.
2. The Engineer shall prepare exhibits and participate in a Value Engineering (VE) study.
3. The Engineer shall assist in conducting public meetings and public hearing during the project development process. The Engineer shall prepare schematic exhibits, constraints maps, other necessary exhibits, and assist the State in the presentation.
4. The Engineer shall participate in a Meeting with Affected Property Owners (MAPO) located within or near the project's study area.
5. The Engineer shall prepare the adjacent property owner list, mail out of meeting notices, notice of public meeting and hearing, draft letter to public officials, prepare and publish notices to major and local newspaper, reserve public meeting and hearing location, hire court reporter and law enforcement for public hearing, audio and visual rental equipment, and assist with conducting public meeting and hearing.
6. Compile public comments received and responses to comments during the public meeting into a summary of public meeting and the public hearing into a Public Hearing Summary Report.

Schematic Design Project Deliverables

In conjunction with the performance of the foregoing services, the Engineer shall provide the following draft and final documents and associated electronic files:

- Two (2) draft copies of the Engineering Summary Report
- Two (2) draft copies of the Interstate Access Justification Report
- Two (2) draft copies of the Preliminary Drainage Study
- Three (3) copies of the Geometric Schematic layouts 11"x17" Cut sheets
- Eight (8) copies of the Geometric Schematic layouts (1 inch = 100 feet)
- Eight (8) copies of the Supplemental Profiles rolls
- One (1) copy of the Preliminary Cross-Sections in a roll plot format

- Eight (8) final copies of the Engineering Summary Report
- Four (4) final copies of the Interstate Access Justification Report
- Six (6) final copies of the Preliminary Drainage Study
- Eight (8) copies of the Preliminary Construction Sequence Layouts
- One (1) electronic copy of the 3D rendering and traffic simulation for the reasonable build alternatives
- Electronic files shall be furnished to the State on a CD or DVD Recordable media
- Two (2) final copies of Project Manager Existing Traffic Conditions Report

Function Code 145 (145) – Project Management and Administration

The Engineer shall:

- A. Perform all work in accordance with the State's latest practices, criteria, specifications, policies, procedures and Standards of Uniformity (SOU). All documents shall be sufficient to satisfy the current SOUs available from the State.
- B. Act as an agent for the State when specified in a work authorization.
- C. Produce a complete and acceptable deliverable for each environmental service performed for environmental documentation.
- D. Incorporate environmental data into identification of alternatives.
- E. Notify the State of its schedule, in advance, for all field activities.
- F. When specified, seek right of entry from public or private land owners to perform environmental services. Right of entry permission shall be written and signed by the land owner. Develop letters or other materials for seeking right of entry. Letters or other materials seeking right of entry shall not be distributed without prior approval of the State. Letters or other materials seeking right of entry shall contain explicit reference to the kinds of activities for which right of entry is requested and an indication of the impacts (if any) that will result from performance of environmental services.
- G. Notify the State as soon as practical, by phone and in writing, if performance of environmental services discloses the presence or likely presence of significant impacts (in accord with 40 Code of Federal Regulations (CFR) 1500-1508). Inform the State of the basis for concluding there are significant impacts and the basis for concluding that the impacts may require mitigation.
- H. Notify the State as soon as practical, by phone and in writing, if performance of environmental

services results in identification of impacts or a level of controversy that may elevate the Transportation Activity's status from a categorical exclusion or environmental assessment, and the State will reassess the appropriate level of documentation.

- I. Make site visits to the project site during AM and PM peak hours to collect real-time photos and video of issues on the project. The Engineer shall provide a summary report of existing traffic conditions.

Function Code 120 (120) – Social, Economic and Environmental Studies and Public Involvement

A. Environmental Documentation.

Each environmental service provided by the Engineer shall have a deliverable. Deliverables shall summarize the methods used for the environmental services, and shall summarize the results achieved. The summary of results shall be sufficiently detailed to provide satisfactory basis for thorough review by the State, The Federal Highway Administration (FHWA), and (where applicable) agencies with regulatory oversight. All deliverables shall meet regulatory requirements for legal sufficiency.

1. Quality Assurance/Quality Control Review

For each deliverable, the Engineer shall perform quality assurance quality control (QA/QC) reviews of environmental documents and on other supporting environmental documentation to determine whether documents conform with:

- a. Current SOUs published by the State's Environmental Affairs Division and in effect as of the date of receipt of the documents or documentation to be reviewed;
- b. Current state and federal laws, regulations, policies, guidance, and agreements between the State and other state or federal agencies; and
- c. FHWA and American Association of State Highway and Transportation Officials (AASHTO) guidelines contained in "Improving the Quality of Environmental Documents, A Report of the Joint AASHTO and American Council of Engineering Companies (ACEC) Committee in Cooperation with the Federal Highway Administration" (May 2006) for:
 - 1) Readability, and

2) Use of evidence and data in documents to support conclusions.

Upon request by the State, the Engineer shall provide documentation that the QA/QC reviews were performed by qualified staff.

1. Deliverables shall contain all data acquired during the environmental service. All deliverables shall be written to be understood by the public and must be in accordance with the TxDOT On-Line Environmental Manual, current Standards of Uniformity (SOU), current guidelines, policies and procedures.
2. Electronic versions of each deliverable must be written in software which is compatible to the State and must be provided in a changeable format for future use by the State. The Engineer shall supplement all hard copy deliverables with electronic copies in searchable Adobe Acrobat™ (.pdf) format, unless another format is specified. Each deliverable shall be a single, searchable .pdf file that mirrors the layout and appearance of the physical deliverable. The Engineer shall deliver the electronic files on CD-R or CD-RW media in Microsoft Windows format.
3. When the environmental service is to apply for a permit (e.g., United States Coast Guard (USCG) or United States Army Corps of Engineers (USACE), the permit and all supporting documentation shall be the deliverable.
4. Submission of Deliverables
 - a. Deliverables shall consist of reports of environmental services performed in addition to a Categorical Exclusion (CE) or Environmental Assessment (EA) document, when applicable.
 - b. The deliverables shall go through an internal quality review before being sent to the State.
 - c. All deliverables must comply with all applicable state and federal environmental laws, regulations and procedures.
5. The State shall provide the State's, FHWA's and other agency comments on draft deliverables to the Engineer. The Engineer shall revise the deliverable:
 - a. to include any State commitments, findings, agreements, or determinations (e.g., wetlands, endangered species consultation, Section 106, Section 4(f)) required for the Transportation Activity as specified by the State;

- b. to incorporate the results of public involvement and agency coordination;
 - c. to reflect mitigation measures resulting from comments received or changes in the Transportation Activity;
 - d. And include with the revised document a comment response form (matrix) in the format provided by the State.
6. All photographs shall be 3.5" x 5" color presentation printed on matte finish photographic paper or 3.5" x 5" color presentation printed on matte white, premium or photo quality laser or inkjet paper. All photographs shall be well focused and clearly depict details relevant to an evaluation of the project area. Provision of photographs shall be one original print of each image or electronic presentations of comparable quality. Comparable quality electronic photograph presentations shall be at least 1200 x 1600 pixel resolution. Photographs shall be attached to separately labeled pages that clearly identify project name, project identification (ID) number, address or Universal Transverse Mercator (UTM) of resource, description of the picture and direction of the photographic view. In addition to the hard-copy prints, an electronic version of each will be submitted with the same identification information as the hard-copy.

B. Technical Reports

Definition of technical report for environmental services: a report detailing resource-specific studies identified during the process of gathering data to prepare an environmental document.

The Engineer shall produce technical reports before an environmental document (CE or EA) is prepared in order to identify issues early in the process. The State will determine which reports will be necessary for any given project. Technical reports must be provided to the State with sufficient detail and clarity to support environmental determination(s). The environmental document shall reference the technical reports.

Environmental technical reports shall include appropriate National Environmental Policy Act of 1969 (NEPA) or federal regulatory language in addition to the purpose and methodology used in delivering the service. Technical reports shall include sufficient information to determine the significance of impacts. Examples of technical reports are listed below:

Purpose and Need

- Water Quality
- Wetlands
- Endangered Species
- Historic
- Archeology
- Air Quality/MSAT
- Noise
- Socioeconomics
- Public Involvement
- Regional Toll Analysis
- Hazardous Materials Impact Studies
- Indirect and Cumulative Impacts Analysis

Minimum Deliverables: (Additional deliverables to be identified, based on work assigned.)

- Draft Report
- Final Report

C. Categorical Exclusion (CE) Content and Format.

1. The CE shall meet the requirements of 23 CFR 771.117, and TAC, Title 43, Part 1, Chapter 2. The CE content shall be in sufficient detail to meet regulatory requirements for legal sufficiency.
2. The format shall follow the format specified in the SOUs.
3. The CE shall be a concise document and shall incorporate by reference the detailed environmental studies.
4. Exhibits to be included in reports or CEs shall not exceed 11" by 17," and shall be in color. Text pages shall be 8.5" by 11". Exhibits and text shall be neat and reproducible via photocopying without loss of legibility. The CE documents shall be reproduced on plain white paper unless otherwise approved in advance in writing by the State.
5. The Engineer shall submit to the State the number of copies specified of the CE. The review and final copies of the CE shall be delivered to the State on computer disk or via e-mail in a searchable PDF format compatible with the State's software. The Engineer shall consult with the State to identify electronic formats acceptable to the State. The

State reserves the unlimited right to revise the electronic copy of the CE. The State reserves the unlimited right to produce paper copies of the CE. The following contents are to be provided in the CE:

- a. A cover sheet which includes the project and project limits, Control Section Job (CSJ) numbers, county, date (month and year) and the title: "Categorical Exclusion."
- b. A brief statement of purpose and need.
- c. A brief discussion of the scope of the Transportation Activity (Existing and Proposed Facility, Right of Way, Utilities and Transportation Improvement Program date).
- d. The CE shall summarize any social, economic, environmental impacts, appropriate mitigation measures, commitments, and address known and foreseeable public and agency concerns.
- e. Public Involvement.
- f. A conclusion with justification that the Transportation Activity qualifies as a CE.
- g. A project location map and typical cross-section.
- h. Correspondence with regulatory agencies.
- i. Pages of any approved applicable transportation plans to demonstrate project consistency with the plans. Transportation plans include: Metropolitan Planning Organization (MPO) long-range metropolitan transportation plan (LRTP or MTP) and Transportation Improvement Program (TIP) or State Transportation Improvement Program (STIP) for areas not within an MPO jurisdiction.

Minimum Deliverables: (Additional deliverables to be identified, based on work assigned.)

- Preliminary Draft CE for district review
- Draft CE for the State's review
- Draft CE for FHWA review
- Final CE

D. Environmental Assessment (EA) Content and Format.

1. The EA shall meet the requirements of 23 CFR 771.119 and TAC, Title 43, Part 1, Chapter 2. The EA content shall be in sufficient detail to meet regulatory requirements for legal sufficiency.

2. Exhibits to be included in reports or EAs shall not exceed 11" by 17," and shall be in color. Text pages shall be 8.5" by 11". Exhibits and text in reports or EAs shall be neat and reproducible via photocopying without loss of legibility. The EA documents shall be reproduced on plain white paper unless otherwise approved in advance in writing by the State.
3. The EA shall use good quality maps and exhibits, and shall incorporate by reference and summarize background data and technical analyses to support the concise discussions of the alternatives and their impacts. The Engineer shall include the following contents in the EA:
 - a. Cover and Cover Sheet: The cover and inside cover sheet of the document must include the following information:
 - 1) Title: Environmental Assessment for [Project Name]
 - 2) Roadway and Limits
 - 3) District and County
 - 4) CSJ
 - 5) by the Texas Department of Transportation
 - 6) Also list any joint and cooperating agencies
 - 7) Month and Year

For federally funded projects the name "U.S. Department of Transportation, Federal Highway Administration" should appear on the cover.

- b. Table of Contents
 - 1) Enumerate chapter headings and subheadings
 - 2) List of tables
 - 3) List of figures
 - 4) Appendices
- c. Purpose and Need

Follow the guidance in the FHWA website (<http://www.environment.fhwa.dot.gov/projdev/tdmneed.asp>) on purpose and need.

Note:

- 1) Introduction

Provide general information about the proposed project or action.

- i. Briefly describe the proposed project's history; include any measures taken to date, such as feasibility studies, early coordination and planning, and a discussion about the proposed project's relationship to regional and statewide planning and transportation plans (logical termini and independent utility, linkage to system, capacity, and projected traffic and transportation demand).

- ii. Logical Termini and Independent Utility

1. Logical Termini.

- a. Additional travel lanes should be proposed only between rational endpoints.
 - b. A rational endpoint is typically a state or federal system roadway, although local thoroughfares may be substituted when state or federal roadways are not appropriate.
 - c. County limits, county lines, or water bodies are not logical termini, regardless of whether the termini match the construction limits.
 - d. The logical termini should reflect the project's need.

Follow guidance on determining logical termini found on the FHWA website

(<http://environment.fhwa.dot.gov/projdev/tdmtermini.asp>) and in the TxDOT On-Line Environmental Manual.

2. Independent Utility

- a. Additional travel lanes should be a reasonable expenditure and should "stand alone," not requiring additional transportation improvements to complete.
 - b. The project must be able to function on its own without further construction of an adjoining segment.
Example: SH 6 is planned to expand from four 12-foot lanes to six 12-foot lanes between SH 288 and IH 45. This typical section will match the six-lane section

of SH 6 at IH 45. These limits address the congestion on SH 6 resulting from recent development.

Follow guidance on independent utility in the TxDOT On-Line Environmental Manual.

iii. Bicycle and Pedestrian Accommodations

1. The State is committed to proactively plan, design, and construct facilities to safely accommodate bicyclists and pedestrians on appropriate facilities.
2. It is critical that bicycle and pedestrian accommodations be considered and discussed as the purpose and need of a project is defined during the environmental process, taking into consideration existing and anticipated bicycle and pedestrian facility systems and needs.
3. In the environmental document, the district should include a discussion in the project description of proposed bicycle and pedestrian facilities. If no bicycle or pedestrian facilities are planned, the document should state why no such facilities are planned.
4. Plans, Specifications, and Estimates (PS&Es) should also ensure that proposed designs include these accommodations, if applicable, and are constructed according to Texas Accessibility Standards and Americans with Disabilities Act Accessibility Guidelines (TAS and ADAAG).
5. If these modes are not accommodated, the document should justify the exceptional circumstances that preclude these provisions.
6. For all urban sections, regardless of the type of improvement, the following guidance is provided:
 - a. For construction projects within existing right-of-way and when the scope of work is limited to within the roadway typical section, the project plans should:

- i. remove barriers to accommodate pedestrians according to Texas Accessibility Standards and Americans with Disabilities Act Accessibility Guidelines (TAS and ADAAG) and the State's PED standard; and
 - ii. accommodate bicyclists by restriping the existing roadway typical section to provide a 14-foot-wide curb lane, when practical.
 - b. When restriping existing pavement to achieve a 14-foot-wide shared-use lane, the minimum lane widths and curb offsets for the appropriate roadway classification defined in the State's Roadway Design Manual should be maintained. Local city and Metropolitan Planning Organization bicycle and pedestrian plans should also be considered.
7. For construction projects within existing right-of-way but when the scope of work involves pavement widening, the project plans should:
- a. accommodate bicyclists by widening the pavement to either provide a 14-foot wide curb lane or a 5-foot bicycle lane;
 - b. Include necessary work to ensure all existing ADA curb ramps comply with current standards; and
 - c. reconstruct or add sidewalks and crosswalks to ensure a continuous ADA compliant pedestrian route.
8. For full reconstruction or new construction projects in urban areas, where new right-of-way is acquired, the project plans should provide the desired geometric values shown in the Roadway Design Manual for each facility type. The inclusion of bicycle and pedestrian facilities should be included in the project plans as appropriate.

9. For rural roadway construction, the project plans should accommodate bicyclists by striping for a 14-foot-wide outside shoulder, when practical.
10. When restriping existing pavement to achieve a 14-foot-wide shared use lane, the minimum lane widths and curb offsets for the appropriate roadway classification defined in the State's Roadway Design Manual should be maintained. Local city and Metropolitan Planning Organization bicycle and pedestrian plans should also be considered.

2) Purpose of the Project

- i. The purpose may be thought of as the "what" -- the essential purpose(s) that the project is expected to address to correct the unsatisfactory condition(s).
- ii. The purpose statement begins with defining the solution without being project specific.
- iii. The purpose statement should include a list of objectives that meet each of the needs identified.

3) Need for the Project

- i. This section identifies and describes the proposed action, transportation problem(s) or other needs. This section establishes the rationale for the project. Resource agencies often focus on this section, so it must be carefully crafted with defensible, supportable information.
- ii. The need may be considered the "why" -- the problem(s) or unsatisfactory conditions that currently exist or are expected to exist.
- iii. Express the need in terms of the problem, not the solution.
- iv. In general, this section should:
 1. Clearly demonstrate that a need exists and should define it in terms understandable to the public.
 2. Clearly describe the problems that the proposed action will correct.

3. Form the basis for the “no action” discussion in the “alternatives” section, and assist with the identification of reasonable alternatives and the selection of the preferred alternative.
- v. More specifically, this section should consider including the following, either in the main body or as attached exhibits or appendices:
1. Charts, tables, maps and other illustrations (i.e., typical cross-sections and photographs) as presentation techniques.
 2. Project Status: Briefly describe the project history, including actions taken to date, other agencies and governmental units involved, actions pending, and schedules.
 3. System Linkage: Is the proposed project a “connecting link”? How does it fit into the system?
 4. Capacity: Is the capacity of the present facility inadequate for the present traffic? For projected traffic? What capacity is needed? What is the level of service for existing and proposed facilities?
 5. Transportation Demand: Include relationship to any statewide plan or adopted urban transportation plan, along with an explanation of the project's traffic forecasts that are substantially different from the estimates from the metropolitan planning organization (MPO) or other regional planning process.
 6. Legislation: Is there a federal, state, or local governmental mandate for the action?
 7. Social Demands or Economic Development: What projected economic development and land use changes indicate the need to improve or add to the highway capacity (new employment, schools, land use plans, and recreation)?
 8. Modal Interrelationships: How will the proposed facility interface with and serve to complement the various modes of

transportation (airports, rail facilities, port facilities, and mass transit services)?

9. **Safety:** Is the proposed project necessary to correct an existing or potential safety hazard? Is the existing accident rate excessively high? Why? How will the proposed facility improve it?
10. **Roadway Deficiencies:** Is the proposed project necessary to correct existing roadway deficiencies (substandard geometrics, load limits on structures, inadequate cross-sections, high maintenance costs)? How will the proposed project improve any of these conditions?

4) **Planning Process**

- i. Give a brief history of the scoping process and all other public involvement, coordination, and previous planning efforts (corridor or subarea plans) relevant to the current project.
- ii. Discuss the related studies and relevant documents, including state and local long- range plans, comprehensive plans, land use plans, transportation plans, and other thoroughfare and mobility plans and their context for the proposed project.
- iii. If the proposed project is not reflected in the state or regional plan, explain the basis for the proposed project.
- iv. List and justify issues for detailed study as determined by the scoping process or previous plan-level studies that meet the State's requirements for public involvement and agency coordination.
- v. List and justify issues eliminated from detailed study based on the scoping process or previous plan-level studies that meet the State's requirements for public involvement and agency coordination.

5) **Public Involvement**

- i. Required public involvement (PI) is not tied to State classification, but rather to the proposed action.
- ii. Follow the most recent PI requirements. Currently the Texas Administrative Code (TAC) requires at least a notice affording an

opportunity for a public hearing (NAOPH) on any added capacity project.

- iii. Summarize any PI in the environmental document, including dates, number of attendees, locations, and common comments. Also summarize how public comments were addressed. Include photos of displays and venue, as appropriate.
- iv. Summarize resource agency and public scoping meetings conducted.
- v. Consider establishing goals and objectives for public involvement that reach beyond meeting regulatory requirements to ensure that:
 - 1. Communication between the project sponsor and the public is two-way and is initiated as early as possible in the project development process so that public concerns can be incorporated into design to the extent possible;
 - 2. The PI list for the project includes all appropriate stakeholders (e.g., people, businesses, and limited English proficiency (LEP) populations in affected communities and consulting agencies); and
 - 3. all stakeholders are aware of the proposed project and understand what is proposed.

6) Cost and Funding Source

- i. Describe the project funding. Do not assume that tolling is the only option for funding a project. Describe all conventional sources of funding and methods of setting priorities for funding from tax revenues.
- ii. A project level analysis is required for all projects proposed as toll roads.
- iii. For projects within large urban MPOs, the impacts of tolling from a system and network perspective need to be addressed in the cumulative analysis section of the document, per the FHWA and TxDOT Joint Guidance for Project and Network Level

Environmental Justice, Regional Network Land Use, and Air Quality
Analysis for Toll Roads, April 23, 2009.

7) Applicable Regulatory Requirements and Required Coordination

- i. List and describe applicable regulatory requirements.
- ii. List and describe required coordination with the appropriate agencies.

d. Alternatives

1) Reasonable Alternatives

- i. This section describes the alternatives selected, as well as those eliminated, and describes the process that was used to develop, evaluate, and eliminate potential alternatives, based on the defined purpose and need of the project. Describe the following:
 - 1. All reasonable alternatives, including those brought forth by the public, consultants or resource agencies;
 - 2. Other alternatives that were eliminated from detailed study;
 - 3. How alternatives were selected for detailed study;
 - 4. The reasons alternatives were eliminated from consideration; and
 - 5. How the alternatives meet the need for the project and avoid or minimized environmental impacts.
- ii. If tolling is proposed for an alternative, this must be clearly described.
- iii. All reasonable alternatives should be discussed at a comparable level of detail.
- iv. The range of reasonable alternatives should begin with the "No Build" Alternative.
- v. A preferred alternative should be selected as a result of a rational screening process based on meeting project objectives, community and natural environmental impacts, cost, and other considerations, which should be explained in the EA. A matrix to compare the alternatives is recommended.

NOTE: Alternatives are reasonable if they have developed in a manner that includes the opinions of other people and organizations, and sound professional judgment is used. One of the keys to legal sufficiency is to not be arbitrary and capricious in deliberations and decision-making.

2) "No Build" Alternative

- i. The "no-build" alternative is always included as a baseline against which other alternatives can be compared.
- ii. As part of the no-build alternative, short-term minor reconstruction that maintains continuing operation of the existing roadway, such as safety upgrading and maintenance, can be considered.

3) Build Alternatives

- i. When there is a large number of build alternatives, only a representative sampling of the most reasonable examples covering the full range of alternatives must be presented.
- ii. Determining the number of reasonable build alternatives in the EA depends on the project and the facts and circumstances of each case.
- iii. Describe the various build alternatives using maps or other visual aids, such as photographs, drawings, typical sections, or sketches.
- iv. A clear understanding of each alternative's termini, location, costs, and the project concept should be detailed including:
 - 1. Number of lanes
 - 2. Right-of-way (ROW) requirements
 - 3. Median width
 - 4. Access control.
- v. Identify the status and extent of the different types of ROW that may be used for the alternatives under consideration for the project:
 - 1. Land that has been or will be reserved or dedicated by local government(s).
 - 2. Land to be donated by individuals.
 - 3. Land to be acquired through advance or hardship acquisition.

NOTE: Where such lands are reserved, the EA should state that the reserved lands will not influence the alternatives to be selected.

- vi. Development of more detailed design for some aspects (e.g., USACE or USCG permits, noise factors, and wetlands) of one or more alternatives may be necessary during preparation of the EA to evaluate impacts or mitigation measures or to address issues raised by other agencies or the public.
- vii. The choice of a preferred alternative is made following the evaluation of alternatives, early coordination, engineering analyses and environmental studies. Districts usually make this decision.
- viii. Right of Way Requirements
 - 1. Discuss right of way and all easements (existing and anticipated, permanent and temporary construction easements). If the project requires additional right of way on an existing highway, appropriate public involvement is required (as outlined in the Texas Administrative Code and the TxDOT On-Line Environmental Manual. It is the State's Right of Way Acquisition Section policy to follow the Uniform Relocation and Real Property Acquisition Act of 1970 (Uniform Act) and FHWA's requirements related to the Uniform Act even if no federal funds are included in the project funding.

At a minimum:

- a. Describe existing right of way (in feet).
- b. If no additional right of way is needed, state this in the document.
- c. Describe the proposed right of way needed in acres, including the number of parcels (if available).
- d. Explain where the proposed right of way will occur (which side of the roadway, where in the project area). State whether there are or are not any residential and commercial displacements.

- e. Describe by location and acreage, any temporary and permanent easements needed. Describe the purpose of the easement(s) (e.g., utilities). Show this information in typical sections and schematics.
 - f. If no additional easements, permanent or temporary construction easements, are needed, state this in the document.
 - g. Disclose any right of way that has been donated or, if purposed, disclose whether there were willing sellers.
 - h. If there are early acquisitions, include the information per right of way guidance provided by FHWA on December 6, 2008.
 - i. For right of way acquisition, FHWA requires the document to include a statement that the acquisition was done in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970, as amended.
2. Demonstrate Uniform Act compliance for projects with early ROW acquisition. Describe previous existing ROW acquisition as per the December 2007 FHWA memo to the Director of the State's Environmental Affairs Department. For ROW purchased after 1971, document Uniform Act compliance. This document will be provided by the State.
3. For projects without early acquisition, state that no advanced acquisition has taken place. Describe the acreage to be acquired and any displaced properties, including residential, businesses (include type of business and any effects on the community if the business cannot continue), public properties, and special use properties. Also include market data that provide information for the potential for displaced properties to relocate, and state that the Uniform Act will be followed.

e. Environmental Impacts of the Proposed Action and Alternatives

a) Description of the Existing Environment

Describe the project area in terms of the existing human (social, economic, and community) and natural environmental setting for the area affected by all alternatives presented in the EA. This section should also identify environmentally sensitive features, including potentially vulnerable neighborhoods and community facilities in and adjacent to the project area. The existing conditions for the following resources and issues should be considered:

i. Land Use

1. Existing Land Use

- a. Describe the setting of the project (urban, rural).
- b. Describe land uses such as homes, businesses, schools or parks to provide an accurate picture of the project area.
- c. Existing land uses should be field-verified and mapped.
- d. Identify neighborhoods by name and boundaries, if available.
- e. What is the natural setting of the project area? At a minimum, describe the type of vegetation, any water courses and any resources that will help provide a complete overall picture of the project area.

2. Currently Planned and Proposed Land Uses

- a. Describe current subdivision, zoning, building permit, and on-site wastewater disposal (i.e., septic tanks) activity, as appropriate, in and adjacent to the project area.
- b. Describe direct land use changes by acreage. This should include a discussion of the current uses and zoning for land that will be acquired for right-of-way.

- c. New location, added capacity, and change in access projects need to address the land use impacts from increased or altered accessibility to the area. This needs to be further expanded in the indirect impacts section when examining the increased desirability of a more accessible area to developers.
- 3. State, Regional, and Local Government Plans and Policies
 - a. State whether the proposed project is consistent with the Texas Statewide Long-Range Transportation Plan 2035 (SLRTP).
http://www.txdot.gov/public_involvement/transportation_plan/report.htm
 - b. Describe any existing corridor or subarea plans that would include the proposed project and whether the proposed project is consistent with those plans and whether those plans met the State's requirements for public involvement and agency coordination, as well as currency (less than five years old) to qualify for incorporation by reference in the environmental document for the proposed project.
 - c. Land use plans by jurisdictions should be shown to illustrate compatibility with local plans and policies. Include future land use and transportation plan maps from the respective plans.
 - d. Describe land use, transportation, environmental, and other community goals, objectives, and policies of applicable local government and regional (i.e., MPO) plans for the project area.
 - e. Describe how the proposed project is or is not consistent with state and local comprehensive plans, transportation plans, and other mobility plans.
 - f. If the project scope is only a portion of the project scope of state and local transportation plans, disclose

the reasonably foreseeable future phases of the facility shown in the plans and include this eventuality in the environmental analysis.

- g. Is the project scope in the document consistent with the project scope in the TIP and STIP and, if applicable, the project scope in the MTP and RTP for all CSJs?
- h. Check the following:
 - i. CSJ number
 - ii. Roadway
 - iii. Limits, and
 - iv. Project description (i.e., type of project, number of lanes, and length)
- i. Address the following questions in the environmental document:
 - i. Is the letting year in the document consistent with the letting year in the TIP and STIP and if applicable the letting year in the MTP and RTP?
 - ii. Is the project cost in the document within reasonable cost consistency of the project cost in the TIP and STIP and if applicable the project cost in the MTP and RTP?
 - iii. Does the document indicate that the project is included in the TIP and STIP and the timeframe of the TIP and STIP?
 - iv. If applicable, does the document indicate that the project is in the MTP and RTP and the timeframe of the MTP and RTP?
 - v. If the project includes more than one CSJ, does the document indicate that all project CSJs are included in the TIP and STIP and if applicable in the MTP and RTP? Does the

project demonstrate how the different CSJs in the planning documents cover the entire project limits and project scope as described in the environmental document?

- vi. Does the document include the funding source, the reasonable total project cost, the date of the cost estimate, and estimated date of completion (open to traffic)? Reasonable total project cost includes preliminary engineering, environmental studies, right of way, utilities, construction and mitigation costs.
- vii. Does the document include copies of the appropriate pages of the TIP and STIP and if applicable the MTP and RTP as an appendix?
- viii. Does the document summarize the STIP information, include a copy of the page from the STIP, indicate the current letting year, funds and total project cost?
- j. Farmlands
- k. Social and Community Resources and Community Impact Assessment
- l. Air Quality
- m. Noise
- n. Water Quality
- o. Floodplains
- p. Wetlands and Other Waters of the U.S.
- q. Vegetation and Wildlife
- r. Threatened and Endangered Species
- s. Coastal Zone Management Plan
- t. Coastal Barriers
- u. Wild and Scenic Rivers
- v. Cultural Resources
- w. Hazardous Materials

- x. Visual and Aesthetic Qualities: Describe the visual quality of current conditions. Are there any unique visual or aesthetic qualities to the project area?
- y. Airports: The document must address and describe any airports located within the vicinity of the project.

b) Environmental Impacts of the Proposed Project

This section includes the probable beneficial and adverse human (social, economic, and community) and natural environmental effects of the proposed project and describes the measures proposed to mitigate adverse impacts. This information is used to compare the proposed project and its impacts with the “No Build” alternative.

NOTE: The narrative of the proposed project impacts should not use the term “significant” in describing the level of impacts. If the term “significant” is used, it should be consistent with the Council on Environmental Quality (CEQ) Guidelines and supported by facts.

- i. The impacts and mitigation measures of the preferred alternative should be described in detail in order to elaborate on information and to make firmer commitments.
- ii. The following information should be included in the EA for the preferred alternative, not necessarily in this order (See numbers 5 through 34 for the scope to be followed for each respective topic.)
 - 1. Land Use Impacts
 - 2. Socioeconomics including Environmental Justice and Limited English Proficiency
 - 3. Historic Properties Archeological Resources
 - 4. Air Quality
 - 5. Traffic Noise
 - 6. Water Quality
 - Determining Impacts to Waters of the U.S. including Wetlands
 - Wild and Scenic Rivers

- Edwards Aquifer
- Floodplains
- Coastal Zone and Barrier Impacts
- Stormwater Permits
- U.S. Army Corps of Engineers Permits
- U.S. Coast Guard Section 9 Permit
- Water Body Modifications and Wildlife Impacts
- 7. Threatened and Endangered Species
- 8. Invasive Species
- 9. Essential Fish Habitat
- 10. Beneficial Landscape
- 11. Farmland Impacts
- 12. Hazardous Materials
- 13. Regional Toll Analysis (If required)
- 14. Public Involvement
- 15. Section 4(f) or Section 6(f) (if required)
- f. Indirect and Cumulative Impacts Analysis
 - 1) Indirect Impacts Analysis (Steps 1-7 per TxDOT's Guidance on Preparing Indirect and Cumulative Impact Analyses, September 2010)
 - 2) Cumulative Impacts Analysis (Steps 1-8 per TxDOT's Guidance on Preparing Indirect and Cumulative Impact Analyses, September 2010)
- g. Mitigation and Commitments
 - 1) Commitments need to be included as Environmental Permits Issues and Commitments (EPIC) items and submitted to the Environmental Affairs Division of the Texas Department of Transportation (ENV) for review. (Draft EPICs are welcome, final EPICs are required.)
 - 2) Finalize EPIC sheet for incorporation into plans (and contractor bidding documents) to ensure that implementation occurs through proper execution of plans, specifications and estimates (PS&E) contract.
 - 3) Ensure that the EPIC sheet language is appropriate for contractor bidding documents and does not use NEPA language (this may require consultation with the Design Division or the Construction Division).

- h. Agency Coordination
- i. Conclusion
 - 1) Preferred Alternative
 - i. Identify which of the alternatives considered is the preferred alternative.
 - ii. Explain how the preferred alternative meets the objectives of the project purpose to meet the stated needs.
 - iii. Explain technical and economic considerations in the selection.
 - 2) Supporting Rationale for the Preferred Alternative
 - i. Explain environmental considerations, specifically focusing on the environmental benefits incorporated into the design of the alternative.
 - ii. Explain the status of permits issued or pending that are required by federal, state, county, and city agencies.
 - iii. State that the preferred alternative complies with all environmental laws and applicable Executive Orders, or provide assurance that these requirements can and will be met at the appropriate times.
- j. References
- k. List of Abbreviations
- l. Appendices

The appendices should include:

- 1) County road map showing project area
- 2) Typical sections (including dimensions) for existing and proposed conditions.
- 3) Schematics and project layouts
- 4) Photographs (including natural resources and potential historic resources)
- 5) Surveys
- 6) Natural Diversity Database check
- 7) Record of any comments and coordination
- 8) Copy of TIP and STIP page

Minimum Deliverables: (Additional deliverables to be identified, based on work assigned.)

- Preliminary Draft EA for district review
- Draft EA for State review
- Draft EA for FHWA review
- Draft EA for Public Hearing
- Final EA

E. Land Use and Socioeconomics

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

The Engineer shall perform Community Impact Assessments (including relocations and disproportionate impacts) in accordance with Executive Order 12898.

The Engineer shall:

1. Compile analysis to meet requirements of TA 6640.8A. Analysis must conform to applicable current State and FHWA guidance.
2. Process for Community Impact Assessment should follow Community Impact Assessment: A Quick Reference for Transportation.
3. Identify and evaluate the social and economic impacts of a Transportation Activity.
4. Use appropriate data sources, such as the United States Census, windshield surveys, maps, public involvement, Multiple Listing Service, and aerial photographs to determine the potential for social impacts. Potential social impacts to be documented include:
 - a. Demographics (population, ethnic or racial distribution, income) based on the most recent census or projections. Census data needs to be presented at the lowest scale available, which for race and ethnicity is the block level. Census data should be compared to the next higher level of aggregation (i.e. block to block group) instead of to the city or the county as a whole. Income data and language data are not available at the block level, and so for these issues, block groups should be compared to census tracts. The document should present data for each block and block group in the study area. Data should be presented in

tabular format, including percentages to make data more useable for comparison purposes.

- b. Estimate the numbers, types of occupancy (owner and tenant) and sizes (number of employees) of businesses and farms to be displaced and describe each. Discuss impacts to the community if businesses are unable to relocate within their current service area. Identify sites available in the area to which the affected business may relocate, the likelihood of such relocations, and potential impact on individual businesses and farms caused by displacement or by proximity of the proposed highway if not displaced.
- c. Other populations (disabled, elderly).
- d. Land uses in the project area (community services, schools, and others). Provide acreage estimates for each identified land use. Discuss current development trends in the area and the local government plans and policies on land use and growth in the area which will be impacted by the proposed project. Discuss, if proposed, Transportation Activity conforms to plans and policies.
- e. Mobility (pedestrian, bicycle, transit, cars, rail).
- f. Safety (traffic and potential for crime).
- g. Identify other potential impacts identified in studies of social impacts.
- h. Identify the property owners and tenants adjacent to a roadway project.
- i. Identify all potential displacements.
- j. Identify tenure of properties to be displaced (whether owned or rented).
- k. Identify potential replacement housing or other replacement sites using Multiple Listing Service for current market data. If Multiple Listing Service is not available, similar source shall be used, provide the rationale for selecting this source is provided in the document. Compare value of property to be displaced with price of available properties of similar size (number of bedrooms) in the area. Comparison between displaced housing and available housing should be provided by tenure. If the preferred alternative has been identified, identification of replacement housing shall be performed only for the preferred alternative. If existing housing inventory is insufficient, does not meet relocation standards, or is not within the financial capabilities of the displaced, a commitment to last resort housing should be included in the document.

- l. Identify changes in neighborhood and community cohesion for the various social groups identified.
- m. Identify impacts on school districts, recreational areas, places of worship, businesses, police and fire protection, and other community services.
- n. Identify the racial, ethnic and income level of affected individuals and communities, in order to determine any disproportionate impacts on any minority or low-income individuals or communities.
- o. Use public contact and public involvement to gather information from individuals and communities regarding social impacts of Transportation Activities. This includes fulfilling the requirements of Executive Order 13166 (Improving Access to Services for Persons with Limited English Proficiency).
- p. Identify possible mitigation measures to avoid or minimize any adverse impacts to the community or specific populations within the project area.
- q. Estimate losses and gains to tax revenues due to the location of Transportation Activities.
- r. Identify and review subdivision plats, current land uses and anticipated land uses by windshield surveys or other type of surveys.
- s. Evaluate travel modes and patterns in a study area, in order to determine any impacts a Transportation Activity may have on access to homes, businesses and community services. Use predictive models, observation, and public contact to determine travel modes and patterns. Identify potential changes in travel patterns due to Transportation Activities.
- t. Identify and evaluate the potential for impacts to disabled and elderly individuals and populations. Use the United States Census and public contact to determine how Transportation Activities may impact these individuals and populations.
- u. Identify whether the project involves a pricing component. If a pricing component is involved, the document shall follow current State environmental guidance for toll projects.

F. Environmental Justice

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

The Engineer shall:

1. Perform an environmental justice analysis. Studies shall fulfill the requirements of Executive Order 12898. Document shall provide a definition of Environmental Justice and describe the Executive Order.
2. Identify Environmental Justice communities within the study area.
3. Determine if the project would have disproportionately high and adverse impacts on Environmental Justice communities. All impacts identified in the Community Impact Assessment and other relevant studies (i.e. noise analysis) should be considered to determine if the impacts disproportionately affect environmental justice communities.
4. Identify possible mitigation measures to avoid or minimize any adverse impacts to the environmental justice population within the project area.

G. Limited English Proficiency

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

The Engineer shall:

1. Demonstrate compliance in environmental documents with Executive Order 13166. Compliance is generally dependent on public involvement activities.
2. Provide a definition of Limited English Proficiency and describe the Executive Order in the document.
3. Identify populations with Limited English Proficiency and the language(s) spoken. Document must list specific commitments to provide access to Limited English Proficiency individuals.

H. Historic Resource Identification, Evaluation and Documentation Services

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

The Engineer shall perform non-archeological historic-age resource studies related to compliance with Section 106 and Section 110 of the NHPA (36 CFR 800). Such studies include, but are not limited to non-archeological historic-age resource surveys, research and documentation efforts leading to historic context statements, nominations to the National Register of Historic Places (NRHP), Historic American Buildings Survey (HABS) and Historic American Engineering Record (HAER) documents, and other mitigation activities such as creating, managing or updating inventories of historic-age properties. Identification, evaluation and documentation tasks shall be completed in accordance with the provisions of the Archeology and Preservation: Secretary of the Interior's Standards and Guidelines (48 FR Parts 44716 et seq. and requirements used by those of the National Park Service, and previously published in 36 CFR Part 61 (SOI Standards)).

The deliverables shall summarize the methods used for the historic resources studies, and shall summarize the results achieved. Each historic resources study shall have a deliverable. The summary of results shall be sufficiently detailed to provide satisfactory basis for thorough review by the State, FHWA, State Historic Preservation Office (SHPO), Texas Historical Commission (THC) and consulting parties. All deliverables shall be in sufficient detail to meet regulatory requirements for legal sufficiency. All deliverables shall be written to be understood by the public and must be in accordance with the TxDOT On-Line Environmental Manual and Attachment C to this contract.

Historic resource studies shall be performed and documented at sufficient levels to satisfy THC requirements for determining the presence of and documenting historically significant properties in the project Area of Potential Effects (APE) in accordance with 36 CFR 60 and 43 TAC, Part I, Chapter 2 and be State SOU compliant. All reports shall include the names and tasks performed of all technical experts associated with the project. Performance of non-archeological historic-age resource studies shall include the following tasks as specified in a work authorization. Deliverables shall be transmitted to the State in electronic and paper formats and meet the requirements set for in the State's SOUs.

I. Reconnaissance Survey for Historic Resources

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

Reconnaissance Survey for Non-Archeological Historic-Age Resources

1. In consultation with the State, the Engineer shall determine the APE and the study limits of the survey area, conduct a literature review appropriate to the project area and its historic-age resources, and prepare a research design for a reconnaissance survey for non-archeological historic-age resources. The research design shall provide a succinct summary of the literature review results including known historic resources and results of public involvement tasks, clear descriptions of identification, evaluation and documentation tasks required, and associated budget figures and production schedules. The Engineer shall submit an electronic format copy of the research design to the State. The State assumes responsibility for transmitting the research design to the THC, as applicable under the PA-TU, and transmitting THC comments to the Technical Expert. The Engineer shall revise the research design to reflect comments by the State and THC. The research design shall be revised pursuant to the State's errors and omissions policy.
2. The Engineer shall conduct a reconnaissance survey conforming to the methodology outlined in the THC-approved research design. The reconnaissance survey shall not be implemented without prior approval of the research design by the State and THC. In addition prior to reconnaissance survey, the technical expert shall ensure that efforts have been made by the appropriate project officials to obtain right-of-entry (ROE) to properties in the study area that have the potential for historic properties if applicable. Each historic-age resource (defined in accordance with 36 CFR 60 as a building, structure, object, historic district or non-archeological site at least 50 years old at the time of letting) in the APE shall be documented in the following manner.
3. The Engineer shall provide photographic documentation for each historic-age resource sufficient in number and perspective to satisfy THC documentation requirements, except under circumstances beyond the Engineer's control. At a minimum this shall include an oblique view with the primary façade and the subject filling the frame. Properties listed or preliminarily determined eligible for the NRHP shall require

additional photographs to be taken, including photographs that show the relationship between the historic resource and the proposed project area. Properties with more than one historic-age resource shall also require additional photographs.

- a. All photographs shall be 3.5" x 5" color presentation printed on matte finish photographic paper or 3.5" x 5" color presentation printed on matte white, premium or photo quality laser or inkjet paper. All photographs shall be well focused and clearly depict architectural and other details relevant to an evaluation of the resource's character-defining features. Provision of photographs shall be one original print of each image or electronic presentations of comparable quality, as specified in a work authorization. Comparable quality electronic photograph presentations shall be at least 1200x1600 pixel resolution.
 - b. Photographs shall be attached to separately labeled pages that clearly identify project name, project ID number, address or UTM of resource, direction of the photographic view, style and form of the resource, NRHP criteria eligibility, resource integrity issues, and a discussion of any limitations when photographing the resource. Style and form will accurately describe the resource.
4. The Engineer shall produce an inventory of all resources, provided in a table form that details their project ID numbers, locations and addresses, property type and subtype classifications, stylistic influences, construction dates, integrity issues and preliminary eligibility recommendations.
5. The Engineer shall provide a technical report detailing the results of the reconnaissance survey. In the report the Engineer shall describe the findings of the reconnaissance survey, including preliminary assessments of direct, indirect and cumulative effects on historic properties, and make recommendations to the State for the need, if any, to conduct intensive survey efforts. The technical report shall have sufficient detail and clarity to provide THC with a basis for making determinations of NRHP eligibility without requiring submission of additional documentation or shall have sufficient detail and clarity to make recommendations concerning the scope of the intensive survey. The technical report should include an outline of the purpose and methodology of the project, a summary of the background history of project area, presenting historic contexts relevant to the time period associated with the historic-age resources in which to evaluate significance of resources for NRHP eligibility, and observations on patterns of settlement, development trends, resource distribution and analysis of survey data. All

appropriate NEPA or federal regulatory language shall be included to provide sufficient clarity concerning eligibility determinations. At a minimum, it shall include the following information:

- a. A brief overview of the results of the reconnaissance survey, including an inventory of historic-age resources requiring no additional survey efforts in order to finalize determinations of NRHP eligibility in accordance with 36 CFR 60.
- b. A separate inventory of historic-age resources requiring additional intensive survey efforts in order to finalize determinations of NRHP eligibility in accordance with 36 CFR 60.
- c. Maps shall be based on aerial photographs. The APE and current and proposed ROW shall be clearly indicated on the map. When possible, the maps shall show delineated parcels that are in the study area. Maps shall show the location of each historic-age resource labeled with its appropriate project ID number, running as consecutively as possible from the top left hand corner to the bottom right hand corner of the map. Outbuildings and landscape features shall be reported as subsets of the main project ID number for a property, for example, a garage associated with Site No. 100 could be labeled Site No. 100a. If an eligible or potentially eligible historic property has multiple resources, the map will have an inset aerial of the site with the labeled resources on the overall map to give the reviewer a site plan. Major street names and other directional landmarks shall be clearly indicated on maps.
- d. Proposed changes to the research design arising from the results of the reconnaissance survey, including contextual issues, comparative property information needs, data gaps and other items necessary to finalize the evaluation and documentation phases of the project in accordance with the SOI Standards.
- e. The Engineer shall revise the technical report to address comments by the State and the THC in accord with the State's errors and omissions policy. The Engineer shall submit a hard copy and an electronic format copy of the technical report to the State. The State shall assume responsibility for transmitting the technical report to the THC and the transmitting THC comments to the Engineer.
- f. When specified in a work authorization or supplemental agreement, the Engineer shall conduct tasks associated with public involvement as part of the

reconnaissance survey conforming to the methodology outlined in the ENV-approved research design.

- g. The Engineer shall contact interested parties when applicable to determine local knowledge of historic resources in the project area. Interested parties include but are not limited to CLG, HPO, CHC, HBF, and other consulting parties.

J. Intensive Survey for Historic Resources

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

Intensive Survey of Non-Archeological Historic-age Resources

- 1. The Engineer shall conduct an intensive survey in accord with the research design. Tasks associated with the intensive survey shall include:
 - a. Completion of a Texas Historic Sites Inventory form or a THC-approved equivalent for each resource identified as potentially NRHP eligible in the reconnaissance survey. At a minimum, each inventory form will provide sufficient detail about the location, physical characteristics, character-defining details, modifications and other integrity issues, associated outbuildings or historic landscape features, contextual relationships and historic background of the resource to finalize determinations of NRHP eligibility in accordance with 36 CFR 60.
 - b. Completion of supplementary photographs of auxiliary resources, landscape features, setting issues, integrity issues, representative streetscapes as detailed below:
- 2. The photographs shall be 3.5" x 5" color presentation printed on matte finish photographic paper or 3.5" x 5" color presentation printed on matte white, premium or photo quality laser or inkjet paper. At a minimum this shall include an oblique view of the primary façades and a side elevation for each resource, with the subject filling the frame. All photographs shall be well focused and clearly depict architectural and other details relevant to an evaluation of the resource's character-defining features. Provision of photographs shall be one original print of each image or electronic presentations of

comparable quality, as specified in a work authorization. Comparable quality electronic photograph presentations shall be at least 1200 x 1600 pixel resolution.

- a. Photographs shall be attached to separately labeled pages that clearly identify project name, project ID number, address or UTM of resource, direction of the photographic view, style and form of the resource, NRHP criteria eligibility, resource integrity issues, and a discussion of any limitations when photographing the resource. Style and form will accurately describe the resource.
 - b. Additional photographs shall be required if architectural alterations including, but not limited to, replacement of historic doors and windows, attachment of synthetic siding, loss of ornamental detailing or unsympathetic additions compromise the historic integrity of the resource.
3. Additional photographs of the inter-relationship of resources shall be required if historic outbuildings or significant landscape features are associated with the property.
 4. Additional photographs of the inter-relationship of resources shall be required if potential or designated historic districts are identified within the APE. These photographs shall document representative streetscapes for each block or significant area within the historic district.
 5. Additional photographs of the inter-relationship of resources shall be required if modern development impacts the historic integrity of the landscape or demonstrates that the historic resource was moved from its original location into the APE.
 6. Preparation of site maps detailing the inter-relationship of resources such as outbuildings and landscape features associated with a potentially NRHP eligible property. Site maps shall include the inter-relationship of potentially NRHP eligible resources to the APE and current and proposed ROW.
 7. Assembly of historical research for each property identified as potentially NRHP eligible in the reconnaissance survey, including comparative information for property types and other contextual information required to finalize determinations of NRHP eligibility in accordance with the SOI Standards.
 8. Evaluation of each property identified as potentially NRHP eligible in the reconnaissance survey against NRHP criteria for significance and integrity in accordance with 36 CFR 60.
 9. The Engineer shall prepare a survey report detailing the results of the intensive survey. This report shall describe the findings of the intensive survey and make

recommendations to the State for NRHP eligibility of all resources and final assessments of direct, indirect and cumulative effects on historic properties. The survey report shall have sufficient detail and clarity to provide THC with a basis for making determinations of NRHP eligibility without requiring submission of additional documentation. At a minimum, the survey report shall include the following information for review and comment by the State and THC:

- a. An outline of the purpose and methodology of the project.
- b. A summary of the background history of project area, presenting historic contexts relevant to the time period associated with the historic-age resources in which to evaluate significance of resources for NRHP eligibility.
- c. Observations on patterns of settlement, development trends, resource distribution and analysis of survey data.
- d. An inventory of resources with proposed determinations of NRHP eligibility for all resources, evaluated against NRHP criteria for significance and integrity in accordance with 36 CFR 60.
- e. Detailed information on potential historic districts, including inventories, maps, photos, background history, justifications of boundaries, and justification of significance.
- f. Project area maps, survey forms, photographs, site maps.
 - 1) Maps shall be based on aerial photographs. The APE and current and proposed ROW shall be clearly indicated on the map. Maps shall show the location of each historic-age resource labeled with its appropriate project ID number, running as consecutively as possible from the top left hand corner to the bottom right hand corner of the map. Outbuildings and landscape features shall be reported as subsets of the main project ID number for a property, for example, a garage associated with Site No. 100 could be labeled Site No. 100a. If an eligible or potentially eligible historic property has multiple resources, the map will have an inset aerial of the site with the labeled resources on the overall map to give the reviewer a site plan. Major street names and other directional landmarks shall be clearly indicated on the map.

- 2) Survey forms include the completion of a Texas Historic Sites Inventory form or a THC-approved equivalent.
10. The Engineer shall revise the survey report to address comments by the State and THC at no additional cost to the State and may be required to integrate the findings into another environmental document. The Technical Expert shall submit a hard copy and an electronic format copy of the survey report to the State. The State assumes responsibility for transmitting the survey report to THC and for transmitting THC comments to the Technical Expert.
11. The Engineer shall conduct tasks associated with public involvement as part of the intensive survey conforming to the methodology outlined in the ENV-approved research design.

The Engineer shall contact interested parties when applicable in order to determine local knowledge historic resources in the project area. Interested parties include but are not limited to: CLG, HPO, CHC, HBF, and other consulting parties.

K. Archeological Background Studies

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

1. The conduct of an Archeological Background Study shall conform to current SOU for Background Studies, available from the State.
2. The Engineer shall undertake the following activities and demonstrate that these activities occurred by providing supporting data to the State.
 - a. Review site files at the Texas Archeological Research Laboratory (TARL) and THC to determine whether previously recorded archeological sites are present in the area to be documented. Review of the Texas Archeological Sites Atlas shall be used for THC file review unless otherwise approved by the State.
 - b. If sites are present, consult relevant site forms and archeological reports to determine the characteristics of the sites.

- c. Produce a clearly reproducible map, based on the United States Geological Survey (USGS) 7.5' topographic maps, indicating areas where recorded archeological sites are present.
 - d. Review Natural Resource Conservation Service (NRCS) soil maps, Bureau of Economic Geology (BEG) geological maps, historic maps, aerial photographs, planning documents, and USGS topographic maps to determine the general characteristics of the study area with respect to the identification of areas where preservation of archeological historic properties and SALs is likely and unlikely.
3. Background studies comprise a review of existing data, including, but not limited to, the Texas Archeological Sites Atlas, geologic maps, soil maps, aerial photographs, and historic maps. Based on this review, the Technical Expert shall identify areas that require field investigation to evaluate the project's effects on archeological resources and areas in which the proposed project would have no effect on archeological resources. The Background Study shall be produced by a professional archeologist as defined in 13 TAC 26.5(52)(B).

L. Archeological Surveys

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

- 1. The conduct of an Archeological Survey (Reconnaissance or Intensive) shall conform to the current SOU for Archeological Survey Reports, available from the State. The Engineer shall undertake the following activities and demonstrate that these activities occurred by providing supporting data to the State.
 - a. Archeological surveys shall be performed for specific proposed transportation activities. Perform archeological surveys under a Texas Antiquities Permit issued by THC and signed by a State professional archeologist (TAC, Title 13, Part 2, Chapter 26).
 - b. Perform surveys, reporting, and documentation to satisfy the National Historic Preservation Act, Section 106 and Antiquities Code requirements for determining whether archeological sites are present in the project area, and whether test excavations or a higher level of archeological work is needed.

- c. An archeological background study shall be performed prior to field work. If the Technical Expert has already performed an archeological background study or has been provided with a background study by the State, a new study will not be required.
 - d. A physical inspection of the project area.
 - e. Documentation of all conditions affecting the potential integrity of archeological deposits in accordance with regulations 36 CFR 60.4 governing eligibility for inclusion in the National Register of Historic Places and regulations TAC, Title 13, Part 2, Chapter 26.8, governing evaluation of archeological sites for designation as SALs.
 - f. Evaluation of the potential for intact archeological deposits to be present in the proposed project area.
 - g. Photo-documentation of evidence supporting a recommendation that deposits in the project area do or do not have sufficient integrity for the preservation of eligible sites. Photo-documentation shall provide a representative record of all relevant impacts reducing the integrity of potential archeological deposits in the project area.
 - h. Surveys will be done in accordance with THC survey standards, unless a different level of effort can be explicitly justified. Eligibility test excavations and data recovery excavations will be authorized at the sole discretion of the State and performed only under a permit specifically issued for that purpose.
 - i. The State encourages the use of mechanically excavated trenches as a reliable site prospection tool during intensive surveys. All trenches excavated for prospection shall be documented in sufficient detail to assure satisfaction of the National Historic Preservation Act, Section 106 and Antiquities Code information needs.
 - j. Items for curation must be prepared in accordance with the most current standards published. The Technical Expert will contact ENV's Archeological Studies Section for a request for housing before sending items to the certified curation facility.
2. Archeological Reconnaissance Surveys - The Engineer shall conduct a Reconnaissance Survey as defined in 13 TAC 26.5(57) and 13 TAC 26.20(1). The Engineer shall submit a permit application for a Texas Antiquities Permit and a report on

the work conducted under the permit. Permit applications for the conduct of an Archeological Reconnaissance Survey shall follow the current SOU for Individual Antiquities Permit Applications, which is available from the State. The content for Archeological Reconnaissance Survey reports shall follow the current SOU for Archeological Survey Reports, which is available from the State. The draft and final report shall also fulfill the reporting requirements for the Texas Antiquities Permit.

3. Archeological Intensive Survey - The Engineer shall conduct an Intensive Survey as defined in 13 TAC 26.5(35) and 13 TAC 26.20(2). The Technical Expert shall submit a permit application for a Texas Antiquities Permit and a report on the work conducted under the permit. Permit applications for the conduct of an Archeological Intensive Survey shall follow the current SOU for Individual Antiquities Permit Applications, which is available from the State. The content for Archeological Intensive Survey reports shall follow the current SOU for Archeological Survey Reports, which is available from the State. The draft and final report shall also fulfill the reporting requirements for the Texas Antiquities Permit.
4. General Specifications for Archeological Reconnaissance and Intensive Survey Reports.

The Engineer shall adhere to the following:

- a. All documentation not submitted for curation shall be submitted to the State.
- b. Final survey reports shall be reproduced on archival quality paper. One printed copy of each site form shall be submitted on archival quality paper.
- c. Surveys shall fully record all archeological sites present in the project area, to the extent feasible within the scope of a survey.
- d. All tables, figures, and maps shall have a number, title, appropriate explanatory note, and a source reference. In addition, where applicable, a north arrow, a scale, and a key shall be displayed. All sections of USGS 7.5' quad sheets shall indicate the name of the sheet.
- e. All bibliographic references in reports shall conform to the American Antiquity style guide.
- f. Maps and figures for all reports and attachments shall be produced to minimize generation loss and shall be suitable for clear reproduction. Unless necessary, maps and figures shall be 8.5" x 11" pages. Continuation sheets for maps and figures should be used where reduction results in loss of legibility.

M. Air Quality Studies

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

The Engineer shall:

1. Prepare the air quality section in accord with the current version of the State's Air Quality Guidelines, Air Quality SOP, and Air Quality SOU. If the Air Quality SOP requires it, the document must contain the following air quality elements in the format prescribed in the Air Quality SOU: Provide the following information for attainment counties in the environmental document:
 - a. A statement indicating that the county or counties where the project is located is in attainment of all National Ambient Air Quality Standards.
 - b. A statement indicating whether or not the project has been included in, and is consistent with, the current metropolitan transportation plan (MTP). If it is not consistent with the MTP, contact the State for further instructions. Either bridging language will need to be used or the project will need to be revised.
2. Provide the following information for nonattainment counties in the environmental document:
 - a. A statement providing the name of the nonattainment area, details on the nonattainment pollutants and nonattainment classification of the county or counties where the project is located.
 - b. A statement indicating whether or not the project has been included in, and is consistent with, the current conforming metropolitan transportation plan (MTP). If it is not consistent with the MTP, contact the State for further instructions. Either bridging language will need to be used or the project will need to be revised.
3. Discuss the congestion management systems for the county or counties where the project is located and a list of committed projects to reduce traffic congestion in those counties.
4. Perform computer modeling of current and future year peak-hour carbon monoxide concentrations at project right-of-way lines using computer models, traffic data, and project plan maps provided by the State for projects that require a carbon monoxide

Traffic Air Quality Analysis (TAQA). Compare the modeled current and future year peak-hour carbon monoxide concentrations to the one hour and eight hour carbon monoxide National Ambient Air Quality Standards. Include documentation of the methods and specifications used in modeling and the results of the modeling in the environmental document. This information should include traffic volumes, computer model(s) used, current and future year carbon monoxide concentrations, and percentages of the National Ambient Air Quality Standards for current and future year.

5. Perform a Mobile Source Air Toxics (MSAT) analysis and provide documentation in accordance with the current version of the State's Air Quality Guidelines, Air Quality SOP, Air Quality SOU, and the 2009 memorandum from FHWA regarding Interim Guidance Updates on Air Toxic Analysis in NEPA Documents. The following are required for a quantitative MSAT analysis:
 - c. A conference call with the State's District, ENV, MPO with jurisdiction, FHWA and the Engineer's Technical Expert.
 - d. The Engineer will take meeting minutes which will include the specifics for performing the quantitative MSAT analysis.
 - e. The analysis will be performed as agreed upon in the conference call and follow the most recent State and FHWA guidelines.
6. Perform a CO/PM hotspot analysis (only applies to CO/PM nonattainment and maintenance areas) and provide documentation in accordance with the current version of the State's Air Quality Guidelines, Air Quality SOP, Air Quality SOU, EPA conformity rule (40 CFR 93), and EPA hotspot guidance documents. If a CO/PM hotspot may be applicable, the conformity consultation process will need to be initiated by the District and MPO. The analysis will be performed as agreed upon in the conference call with the Consultation Partners.
7. Complete air quality cumulative and indirect impacts analysis as specified in the Cumulative and Indirect Impacts Analysis section of this attachment and include a discussion of the analysis in the environmental document. Contact the State if further guidance is needed.
8. Prepare a statement of construction activities.
9. Respond to public comments received on air quality issues.

N. Traffic Noise Studies

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

The Engineer shall:

1. Perform a traffic noise analysis in accordance with the current version of the State's (FHWA approved) "Guidelines for Analysis and Abatement of Roadway Traffic Noise." Noise analyses shall be performed for all alternatives.
2. The State will provide a copy of the current version of the guidelines. Upon request, the State will provide the Technical Expert with existing and predicted (future) traffic data and, when available, aerial photography.
3. By project location site visit, identify adjacent, land use development and photo document representative receivers that might be impacted by highway traffic noise and may benefit from feasible and reasonable noise abatement.
4. Determine existing and predicted noise levels for representative receivers, as follows:
 - a. For transportation activities on new location, take field measurements of existing noise levels. Field measurements shall be accomplished with sound meters that meet or exceed American National Standards Institute (ANSI) S1.4-1983, Type 2.
 - b. For transportation activities not on new location, perform computer modeling of existing noise levels and predicted (future) noise levels.
 - c. Computer modeling shall be accomplished with the latest FHWA approved Traffic Noise Model (TNM) software program which must be purchased at the Technical Expert's expense from the software distributor.
5. Identify impacted receivers in accordance with the absolute and relative impact criteria.
6. Consider and evaluate all required noise abatement measures for impacted receivers in accordance with the feasible and reasonable criteria.
7. Propose noise abatement measures that are both feasible and reasonable.
8. Determine predicted (future) noise impact contours for transportation activities where there is adjacent undeveloped property where residential or commercial development is likely to occur in the near future.

O. 15. Water Quality Studies

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

The Engineer shall:

1. Address all water quality studies in accordance with Section 303(d) of the Clean Water Act as administered by the Texas Commission on Environmental Quality (TCEQ).
2. Identify if the project will discharge to listed or threatened waters. List the segment number and name.
3. Identify if the project will discharge to a water body that is within five miles upstream of listed or threatened waters.
4. Identify the pollutant(s) in the discharge for which the water body is listed.
5. Identify if the project could discharge the pollutant identified in (d) above. If yes, discuss measures that will be taken to prevent or reduce the likelihood of such a discharge.
6. Discuss the Best Management Practices that will be used-particularly at the discharge point to the water body to meet other water quality regulations, such as vegetative swales, silt fencing, compliance with the Texas Pollutant Discharge Elimination System (TPDES).

P. Determining Impacts to Waters of the United States, including Wetlands

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

The Engineer shall:

1. Identify all waters within the boundaries of the project area.
2. Make a preliminary determination of USACE jurisdiction. Restrict the level of effort to identification without formal delineation
3. Delineate waters of the United States, including wetlands.
 - a. Provide documentation which shall include all field work and compilation of field documentation for wetland delineations. Wetland delineations shall be performed in accordance with the current USACE Wetlands Delineation Manual

- (Technical Report Y-87-1) and, if appropriate, the Great Plains, Arid West, or Atlantic and Gulf Coastal Plain Supplement to Technical Report Y-87-1.
- b. Stake wetland boundaries in the field.
 - c. Map the boundaries of the waters of the United States with the global positioning system per guidance from the USACE-Galveston.
4. When required, the State will provide a land survey of wetland boundaries.
 5. When the environmental service is to apply for a permit, the permit and supporting documentation shall be the report and deliverable.
 6. Draft and Final Deliverable.
 - a. The Engineer shall produce a draft and final report of wetland determinations and delineations. The draft report shall be submitted to the State for review and approval by the State and USACE. In the final report, address State and USACE comments from the draft report. The revised final report shall be delivered to the State within 30 days of receipt of comments from the State or USACE.
 - b. The location of all sites, cities, villages, highways, rivers and other features or place names discussed in the text and situated in the project locale shall be shown on the appropriate figure. All tables, figures and maps shall have a number, title, appropriate explanatory note and a source reference. In addition, where applicable, figures and all maps shall display a title, north arrow, scale, legend and source reference.
 - c. The report shall be in the following format:
 - 1) Introduction
 - i. Who authorized the wetland delineation.
 - ii. Why the wetland delineation is being done.
 - iii. Location of site (USGS 7.5' Map).
 - iv. Date of field visit(s).
 - v. Identification of delineators.
 - 2) Methods
 - i. Brief description of the method used.
 - ii. State any modification of the method.
 - iii. Source of existing information.
 - 3) Results and Discussion

- i. Description of the site.
- ii. Topography of the site.
- iii. Plant communities of the site.
- iv. Soil types identified on the site.
- v. Hydrology information of the site.
- vi. Existing wetland mapping (e.g., NWI, state, and local).

4) Findings

- i. Types of wetlands identified on the site (e.g., Cowardin, et al. 1979).
 - Description of wetlands identified.
 - Locations of wetlands.
 - Area of wetlands (in acres).
 - Contrast with non-wetland.
 - How was the wetland boundary chosen (e.g., feature on landscape).
- ii. Types of other waters of the United States identified on the site.
 - Description of the other waters of the United States.
 - Locations of the other waters of the United States.
 - Area of the other waters of the United States.
 - Contrast with non-wetlands.
 - How was the other water of the United States boundary chosen (e.g., feature on landscape).

5) Conclusion.

- i. Table summary of total area and types of wetlands and other regulated waters.
- ii. A map showing each location where a Wetland Data Form was completed.
- iii. Statement regarding the need for permits.
- iv. Caution that final authority rest with the appropriate agencies.

6) Literature Cited.

- 7) Appendix (Routine Wetland Determination Data Forms and, if required, Atypical Situation Data Forms).

Q. Wild and Scenic Rivers

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

The Engineer shall determine the Transportation Activity's impacts on rivers in the National Wild and Scenic River System. If a river in the National Wild and Scenic River System is located in the study area or will be affected by the Transportation Activity, identify and perform coordination with the agency or regulatory agencies with jurisdiction.

The Engineer shall:

1. Include information on the management plan for a listed river, affected land use, and any necessary Section 4(f) coordination.
2. Document coordination with the agency or agencies with jurisdiction.
3. Identify potential adverse effects on the natural, cultural, and recreational values of rivers listed on the Nationwide River Inventory (NRI) or study river.
4. Review the Transportation Activity's adverse effects on alteration of free flowing nature of river, alteration of the setting, or deterioration of water quality.
5. Address listed adverse effects and document consultation on avoiding or mitigating the impacts with the managing agency.
6. Identify measures proposed to avoid or mitigate such impacts.
7. Fulfill the requirements of 16 United States Code (USC) 1271-1287.

R. Edwards Aquifer Impact

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

The Engineer shall determine the impacts of the transportation activity on the Edwards Aquifer for the Austin, San Antonio and Laredo Districts only. Include information on TCEQ

coordination requirements under the Edwards Aquifer Protection Program when impacts within the recharge, transition, or contributing zones deem it necessary.

S. Floodplain Impacts

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

The Engineer shall determine whether the Transportation Activity has the potential to affect floodplains. Document Trinity River Corridor Development Certificate Regulatory Zone requirements (Dallas and Fort Worth Districts), and International Boundary Water Commission (IBWC) requirements (Transportation Activity within the floodplain of the Rio Grande) if the project is within the area covered by these regulations. Studies for floodplain impacts shall fulfill the requirements of Executive Order 11988 and 23 CFR 650, Subpart A.

The Engineer shall:

1. Briefly describe the watershed characteristics of the study area in terms of land uses and changes in land use that may affect stream discharge.
2. Briefly describe the streams in the study area, including evidence of stream migration, down cutting, or aggradations.
3. Identify the presence and nature (e.g., zone A, zone AE, zone AE with floodway) of any Federal Emergency Management Agency (FEMA) mapped floodplains. Include the panel number.
4. Indicate the existence of any significant development associated with the mapped area and identify the jurisdiction responsible for the floodplain.
5. Identify the locations where an alternative will encroach on the base (100-year) floodplain ("encroachments"), where an alternative will support incompatible floodplain development and the potential impacts of encroachments and floodplain development. This identification should be included in the text and on a map.
6. Include a list of all jurisdictions having control over floodplains for each alternative.
7. Where an encroachment or support of incompatible floodplain development results in impacts, the report shall provide more detailed information on the location, impacts and appropriate mitigation measures. In addition, if any alternative (I) results in a floodplain encroachment or supports incompatible floodplain development having significant

- impacts, or (2) requires a commitment to a particular structure size or type, the report shall include an evaluation and discussion of practicable alternatives to the structure or to the significant encroachment. The report shall include exhibits which display the alternatives, the base floodplains and, where applicable, the regulatory floodplains.
8. For each alternative encroaching on a designated or regulatory floodplain, the report shall provide a preliminary indication of whether the encroachment would be consistent with or require a revision to the regulatory floodplain. If the preferred alternative encroaches on a regulatory floodplain, the report shall discuss the consistency of the action with the regulatory floodplain. In addition, the report shall document coordination with FEMA and local or state agencies with jurisdiction indicating that revision would be acceptable or that a revision is not required.
 9. If the preferred alternative includes a floodplain encroachment having significant impacts, the report shall include a finding that it is the only practicable alternative as required by 23 CFR 650, Subpart A. The finding shall refer to Executive Order 11988 and 23 CFR 650, Subpart A. In such cases the report shall document compliance with the Executive Order 11988 requirements and shall be supported by the following information:
 - a. The reasons why the proposed action must be located in the floodplain;
 - b. The alternatives considered and why they were not practicable; and
 - c. A statement indicating whether the action conforms to applicable state or local floodplain protection standards;

T. Coastal Zone and Barrier Impacts

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

The Engineer shall determine if the proposed activity complies with Texas' approved coastal management program and will be conducted in a manner consistent with the Texas Coastal Management Program and the Coastal Zone Management Act by avoiding and minimizing impacts to coastal natural resource areas.

U. Stormwater Permits (Section 402 of the Clean Water Act)

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

The Engineer shall:

1. Describe the need to use the TPDES General Permit, TX 150000. The text will describe how the project will comply with the terms of the TPDES, including the Stormwater Pollution Prevention Plan.
2. Describe the need for Municipal Separate Storm Sewer System notification.

V. USACE Permits

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

1. Section 10 of the Rivers and Harbors Act (33 USC 403). The Engineer shall determine whether the Transportation Activity requires a Section 10 permit and upon approval by the State, prepare and submit permit applications to USACE and obtain the permits.
2. Section 404 of the Clean Water Act (33 USC 1344). The Engineer shall determine whether the Transportation Activity requires a Section 404 permit (Nationwide or Individual Permit (IP)) and upon approval by the State, prepare and submit permit applications (Pre-Construction Notification (PCN) or individual permit application) to USACE and obtain the permits. PCNs and IPs will be prepared in accordance with current USACE policies and regulations.
3. If the permit is an Individual Section 404 permit, upon approval by the State, prepare and submit a Tier 1 checklist or a Tier II 401 certification questionnaire and water quality certification documentation to TCEQ and USACE.
4. The Engineer shall provide the State with documentation (including all original correspondence) of consultation with USACE and TCEQ.
5. The Engineer shall keep the State informed during the permit coordination process.

W. USCG Section 9 Permit (33 USC 401)

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

The Engineer shall:

1. Determine whether streams or other water bodies crossed by a proposed transportation facility are navigable as defined in the USCG Commandant Publication P16591.3A, "Bridge Permit Application Guide."
2. Consult with the USCG to obtain Coast Guard concurrence on navigability and the need, if any, for a USCG Bridge Permit.
3. Provide the State with documentation (including all original correspondence) of consultation with the Coast Guard.
4. Upon approval by the State, submit permit application and obtain a USCG Bridge Permit for bridges crossing navigable waters. The permit(s) shall be obtained in accordance with the USCG Commandant Publication P16591.3A, "Bridge Permit Application Guide."

X. Water Body Modifications and Wildlife Impacts

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

The Engineer shall identify water body modifications and impacts to wildlife. Studies shall fulfill the requirements of FHWA Technical Advisory T 6640.8A (1987) and Texas Administrative Code (TAC), Title 43, Part 1, Chapter 2.

Y. Threatened or Endangered Species

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

The Engineer shall perform biological services.

1. Surveys for Protected Species or Habitat of Protected Species.

The Engineer shall:

- a. Perform surveys of protected species or habitat of protected species. This shall include:
 - 1) All species listed by the United States Fish and Wildlife Service (USFWS) as threatened or endangered or proposed for listing as threatened or endangered (50 CFR 17.11-12),
 - 2) All species that are candidates for review for listing by USFWS as threatened or endangered (per most recently updated list in Federal Register),
 - 3) Species listed as threatened or endangered species by the State of Texas Threatened and Endangered Species Listings, Texas Park and Wildlife Department (TPWD),
 - 4) Species protected by the Migratory Bird Treaty Act (50 CFR 10.13).
- b. Examine existing data to determine the likelihood that rare species, protected species, their habitat, or designated critical habitat (per 50 CFR 17.94-95) could be impacted by the Transportation Activity. Existing data shall include the Element Occurrence Identification (EOID) records of the TPWD Natural Diversity Database, following the Guidelines set forth in the most current version of TPWD's Guidelines for TXNDD Data Analysis in TxDOT Environmental Documents.
- c. Perform an effect determination pursuant to the Endangered Species Act (ESA) for all federally listed species. A determination of impact must be included for all state-listed species. The determination of effect and impact must be supported by evidence, and may require a detailed assessment. Any technical reports used to support the determination(s) must be referenced and provided to the State.
- d. Determine whether critical habitat is present in the study area and whether the Transportation Activity will affect that critical habitat.
- e. Perform species-specific habitat surveys, presence or absence surveys for protected species, or critical habitat (per 50 CFR 17.94-95) and rare species.
- f. Conduct surveys for the presence or absence of protected species according to protocols adopted by USFWS and TPWD for all protected species for which such protocols have been established.

- g. Personnel conducting presence or absence surveys for protected species shall hold appropriate USFWS and TPWD permits at the time surveys are performed.
 - h. Conduct presence or absence surveys during the time of the year appropriate for each species. If the Technical Expert believes that a work authorization to conduct a presence or absence survey does not adequately consider timing of the survey, notify the State as soon as the issue with the survey timing is recognized.
 - i. Furnish the State with Technical Expert's field notes when requested by the State.
 - j. Coordinate between the State and USFWS or TPWD as directed by the State to ensure proper rules, regulations and policies are followed for biological services. All coordination between the Technical Expert and resource agencies shall be approved in advance by the State.
- 2. Habitat Analysis and Characterization of Project Study Area. The Engineer shall perform an analysis and characterization of habitat and habitat impacts for the study area. The habitat analysis shall be based on the most current State and TPWD Memorandum of Understanding With Natural Resources Agencies and Memorandum of Agreement Between State and TPWD for Finalization of 1998 MOU, Concerning Habitat Descriptions and Mitigation.
 - a. For transportation activities involving no new right-of-way or easements, including temporary easements, this includes:
 - 1) The habitat descriptions of habitat types (e.g., forested, prairie, riparian, floodplain, rangeland, agricultural) in the study area are based upon The Vegetation Types of Texas, Including Cropland (TPWD, 1984).
 - 2) The habitat description shall indicate the vegetative type(s) listed for the study area in The Vegetation Types of Texas, Including Cropland (TPWD, 1984).
 - 3) The habitat description shall include a description of the existing vegetation within and adjacent to the right-of-way, broken down by plant community.
 - 4) The habitat description shall indicate whether an S1, S2, or S3 vegetation series listed in "Plant Communities of Texas (Series Level)" (Texas

Natural Heritage Program, April 1993) is present within or adjacent to the right-of-way.

- 5) The habitat description shall describe habitat for protected species if such habitat occurs within or adjacent to the right-of-way.
- 6) The description shall be supplemented with topographic maps (based on USGS 7.5' maps, aerial photos, and on-site photographs).
 - i. Maps and aerial photos shall be annotated to indicate the locations and areas of distinct vegetative types (per The Vegetation Types of Texas, Including Cropland) or S1, S2, or S3 vegetation series (per "Plant Communities of Texas (Series Level)") if any have been identified during field inspections.
 - ii. Photographs shall illustrate representative vegetation for each vegetation type. Aerial photographs (with dates) shall be provided when available.
- b. If the vegetation within the right-of-way does not match the description in The Vegetation Types of Texas, Including Cropland or if there is an unusual difference between the vegetation in the right-of-way and outside the right-of-way, details shall be included in the description to clearly explain the differences in vegetative content between the existing vegetation and the vegetative types described The Vegetation Types of Texas, Including Cropland. Unusual vegetation features may include:
 - 1) Unmaintained vegetation,
 - 2) Trees or shrubs along a fence line adjacent to a field (fencerow vegetation),
 - 3) Riparian vegetation (particularly where fields and cropland extend up to the riparian corridor),
 - 4) Trees that are unusually larger than other trees in the area,
 - 5) Unusual stands or islands of vegetation,
- c. If special habitat features are present, details shall be included in the description to clearly describe the feature(s) present and to explain why the feature(s) should be regarded as special. Special habitat features include:
 - 1) Bottomland hardwoods,

- 2) Caves,
 - 3) Cliffs and bluffs,
 - 4) Native prairies (particularly those with climax species of native grasses and forbs),
 - 5) Ponds (temporary and permanent, natural and man-made),
 - 6) Seeps or springs,
 - 7) Snags (dead trees) or groups of snags,
 - 8) Water bodies (creeks, streams, lakes, and rivers),
 - 9) Existing bridges with known or easily-observed bird or bat colonies.
- d. For transportation activities involving new right-of-way or easements, including temporary easements, the habitat description shall address the entire study area. For projects with multiple alternatives, all alternatives shall be described to the same level of detail. If lack of access to the new location right-of-way limits field observation for the habitat description, existing published sources shall be used to provide an estimate. All elements of description required for projects with no new right-of-way (above) shall be included. Land use within and outside the proposed right-of-way shall be described. In addition, the description of vegetation in the new right-of-way or easements shall include the following:
- 1) Dominant Species for each vegetation stratum (i.e., tree, shrub, vine, herbaceous [grass and forbs]) present,
 - 2) Height of trees (range), if present,
 - 3) Diameter at Breast Height (DBH) of trees (range and average), if present,
 - 4) Percent canopy cover of trees, if present,
 - 5) Acreage for each vegetation type present.
- e. The habitat analysis shall contain a description of anticipated impacts to the following:
- 1) Any vegetation, broken down by plant community (as above),
 - 2) Unusual vegetation features (as above),
 - 3) Special habitat features (as above),
 - 4) Habitat for any protected species (as above),
 - 5) Any other habitat feature identified by and considered to be important to the State's District.

Note: The description of anticipated impacts shall be based on impacts that can be predicted as a result of construction activities and the kind(s) of facility proposed for the Transportation Activity. If the Technical Expert believes that the State has not provided sufficient engineering and other data to support a description of anticipated impacts, notify the State, and the Technical Expert and the State shall negotiate an appropriate level of description of anticipated impacts.

3. Survey Reports and Habitat Analyses shall include:
 - a. Sources for and results of preliminary data collection,
 - b. The name(s) of the person(s) performing the fieldwork,
 - c. Dates of fieldwork,
 - d. Weather conditions at the time of the survey(s),
 - e. Results of TPWD Natural Diversity Database (TXNDD) search as per current TPWD Guidelines for TXNDD Data Analysis in TxDOT Environmental Documents,
 - f. Protected species and habitat for which survey was performed,
 - g. Whether the protected species is absent or present,
 - h. Whether potential habitat for protected species (including designated critical habitat) is present,
 - i. Survey protocols or other methods used,
 - j. Analysis of the Transportation Activity's potential to affect species, habitat, and designated critical habitat,
 - k. Appropriate shapefiles (GIS), 7.5 minute USGS topographic map(s), and aerial photographs showing all areas surveyed for protected species, habitat for protected species, designated critical habitat boundaries, if any, and location(s) of protected species occurrence; and,
 - l. Photographs typical of the area(s) surveyed.
4. Analysis of Stream Modifications and Associated Habitats. The Engineer shall provide a habitat impact analysis when modification of a stream channel is included as part of the Transportation Activity where the streambed is being relocated, straightened, altered (deepened or widened), or cleaned as a part of road or bridge construction or as an easement involving drainage improvements.

- a. The report on the habitat impact analysis shall describe impacts; both direct and indirect, to the adjacent riparian habitats associated with stream modifications, and shall include:
 - 1) A description of existing vegetation that includes all elements listed in this attachment,
 - 2) Areal extent of temporary and permanent impacts, in acres, including impacts in temporary or permanent easements outside the State's proposed right of way,
 - 3) Type of impacts proposed to affect the channel (e.g., channelization, fill, excavation) and adjacent surfaces (e.g., vegetation clearing for equipment operation).
- b. Stream Modification and Associated Habitats Reports shall include:
 - 1) Sources for and results of preliminary data collection,
 - 2) The name(s) of the person(s) performing the fieldwork,
 - 3) Dates of fieldwork,
 - 4) Weather conditions at the time of the survey(s),
 - 5) Whether the protected species is absent or present,
 - 6) Survey protocols or other methods used,
 - 7) Analysis of the Transportation Activity's potential to affect the channel,
 - 8) Appropriate shapefiles (GIS), 7.5 minute USGS topographic maps, and aerial photographs showing all areas surveyed; and,
 - 9) Photographs typical of the area(s) surveyed.

Z. Invasive Species

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

The Engineer shall address Executive Order 13112 on Invasive Species as per FHWA guidance.

AA. Essential Fish Habitat

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

The Engineer shall perform Essential Fish Habitat studies. Studies shall fulfill the requirements of 50 CFR 600.920.

The Engineer shall:

1. Determine if Essential Fish Habitat is present in the project area.
2. Determine if the project will adversely affect Essential Fish Habitat.
3. Describe adverse impacts, if any.

BB. Beneficial Landscaping

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

Address Executive Memorandum on Beneficial Landscaping of April 26, 1994 as per FHWA guidance.

CC. Farmland Impacts

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

Determine farmland impacts. Identification of farmland impacts shall be in accord with the Farmland Protection Policy Act (FPPA) (7 USC 4201 et. seq.) and FHWA guidance on addressing FPPA, which includes determining whether the project is exempt or completion of form AD 1006 or CPA 106 as appropriate.

DD. Initial Assessment of Hazardous Materials Impacts

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

The Engineer shall:

1. Perform a hazardous material Initial Site Assessment (ISA) for potential hazardous materials impacts. The ISA shall determine the potential for encountering hazardous materials in the study area, including possible environmental liability, increased handling requirements (e.g. soil or groundwater), and potential construction worker health and safety issues.
2. The performance of the hazardous materials ISA will be sufficient to satisfy the State's current Standards of Uniformity (SOU) for Hazardous Materials Initial Site Assessments, available from the State.
3. Determine the appropriate project-specific level of inquiry for the ISA. Consider preliminary project design and right-of-way requirements, including project excavation requirements, anticipated right of way acquisition, and the demolition or modification of structures.
4. Produce and submit to the State a completed ISA using the State's ISA SOU format.
5. The Engineer's completed ISA shall include, when applicable, full copies of list search reports, including maps depicting locations, copies of agency file information, photographs, recommendations, and any other supporting information gathered by the Engineer to complete the ISA.
6. Based on the ISA information, the Engineer shall provide the State a report discussing the known or potential hazardous materials impacts suitable for inclusion in the environmental document. The report of hazardous materials impacts shall include, when applicable:
 - a. A concise summary of relevant information gathered during the ISA, including sufficient information to show that the study area for the Transportation Activity was adequately investigated for known or potential hazardous material contamination.
 - b. A concise description of the scope of the hazardous materials ISA, disclosure of any limitations of the assessment, and a statement indicating who performed the assessment.
 - c. A concise summary of the findings of the assessment for each alternative considered, along with an opinion of the potential of an identified site to impact the project during construction.

- d. A discussion of any commitments recommended for performing further investigation of suspect areas, and justification for postponement of further investigation.
 - e. A summary of efforts to be employed by the State to avoid or minimize involvement with known or suspected hazardous material contamination sites during construction, and justification for not avoiding contaminated sites within the preferred alternative or corridor alignment.
 - f. Disclosure of known or suspected hazardous material contamination that is anticipated to be encountered during construction.
 - g. A discussion of any required or recommended special considerations, contingencies or provisions to handle known or suspected hazardous material contamination during right-of-way negotiation and acquisition, property management, design and construction.
 - h. A summary of any early coordination or consultation conducted with the regulatory agencies, local entities or property owners.
 - i. A discussion of any further hazardous materials related coordination with, and approvals or permits required from, the regulatory agencies or other entities.
7. Should the findings of the ISA conclude that additional investigation, special considerations, or other commitments from the State are required during future stages of project development, the Engineer shall review those findings and commitments with the State prior to completing the hazardous materials discussion for the environmental document.

EE. Regional Toll Analysis (if required)

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

See Federal Highway Administration (FHWA) and Texas Department of Transportation (TxDOT) Joint Guidance for Project and Network Level Environmental Justice, Regional Network Land Use, and Air Quality Analyses for Toll Roads April 23, 2009.

FF. Public Involvement (23 CFR 771.111)

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

The Engineer shall:

1. Perform public involvement activities in accordance with TAC, Title 43, Part 1, Chapter 2 and 36 CFR 800.2.
2. Develop a plan for public involvement activities. The plan shall specify all activities to be performed and alternatives to be discussed during public involvement activities. Public involvement activities must be carried out in compliance with EO 13166 and EO 12898. The plan shall also discuss outreach strategies for both the general public and targeted strategies for Environmental Justice and Limited English Proficiency populations.
3. Compile, maintain and update a mailing list of people, agencies and organizations interested in the Transportation Activity.
4. Make all arrangements for public meetings and hearings, including the site of the meetings, mailing and publishing notices, preparation of exhibits, provision for taping or transcription of proceedings, and any other arrangements as directed by the State. The Technical Expert shall not hold public meetings or hearings in the absence of State personnel.
5. Submit all legal notices to the State for review no less than two weeks prior to publication.
6. Arrange a meeting with the State to review all exhibits and other materials to be used prior to public meetings or hearings.
7. Obtain the State's approval for all legal notices, exhibits, and other materials.
8. Provide personnel to staff meetings and hearings, including people to perform registration, make presentations, and answer questions. Staffing levels of personnel to be provided shall be identified.
9. Develop and submit to the State a written summary of the public meeting including when the meeting was conducted, where the meeting was held and who was in attendance. The summary shall also include the comments received and responses to comments, as well as modifications, if any, to the project resulting from comments

received. Summary of public involvement shall be included in the environmental document.

10. Develop and submit to the State a comment and response report, summary and analysis, required certification, verbatim public hearing transcript and other information necessary to evaluate and disseminate information from public hearings. The comment and response report, summary and analysis, and other information shall be sufficiently detailed to provide a full administrative record of questions asked, issues and concerns raised, and responses given during the hearing. The comment and response report, summary and analysis, or other information shall be sufficiently detailed to provide a basis for incorporating all information gathered at public hearings into the environmental document. The final public hearing documentation submitted to the State shall include: Summary and Analysis; Comment and Response Report (including copies of all written comments received and response letters); verbatim transcript and certification signed by the District Engineer.
11. Develop and send acknowledgement letters and response letters to commenters at public meetings or hearings. The Technical Expert shall not distribute acknowledgement or response letters without prior approval by the State.
12. Develop, publish, and distribute a newsletter on the Transportation Activity, including compiling and maintaining a mailing list. The Technical Expert shall not distribute the newsletter without prior approval by the State.
13. Develop and maintain a web site to disseminate information on the Transportation Activity and to gather comments from the public. The web site shall be approved by the State prior to making it available to the public over the internet. All updates to the web site must be approved by the State prior to posting.

GG. Section 4(f) Evaluations.

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

1. The 4(f) Section of the environmental document shall document all data necessary to address to the satisfaction of FHWA potential use of Section 4(f) properties in accordance with 23 CFR 774.

2. The Section 4(f) Evaluation shall conform to the following outline:
 - a. Proposed Project.
 - b. Purpose and Need for the Project. This is a detailed discussion with the needs of the project divided into the following three categories, as applicable: structural deficiencies, functional inadequacies, and geometric deficiencies
 - c. Objectives of the Project.
 - d. Description of the 4(f) Properties.
 - e. Prediction of Effects of Each Alternative on the 4(f) Properties.
 - f. Do Nothing (No build alternative).
 - g. Improve the Existing Facility Without Using 4(f) Properties.
 - h. Build an Improved Facility on New Location Without Using 4(f) Properties.
 - i. Describe Project Alternatives that use 4(f) Properties with an alternatives matrix.
 - j. Measures to Minimize Harm.
 - k. Coordination with Relevant Public Agencies and Private Organizations (A letter from the officials with jurisdiction or property owner must be included as an attachment to the 4(f) document).
 - l. Conclusion Summary.
 - m. For Section 4(f) Evaluations, the appropriate checklist must be completed and attached.
3. Report states the reason a Section 4(f) evaluation is being completed and references project listed in Statewide Transportation Improvement Program (STIP), including date of STIP.
4. Report discusses the presence of any other Section 4(f) properties located in the project area.
5. All Section 4(f) evaluations shall meet the requirements set for in the State's SOUs.

HH. Section 6(f) Evaluation

(This scope is for the corresponding section(s) as listed in the Environmental Impacts of the Proposed Project section of the EA.)

The Engineer shall determine if Land and Water Conservation Fund Act funds were used for the Section 4(f) property in accordance with the regulatory requirements and TPWD guidelines.

II. Re-evaluation

The Engineer shall develop re-evaluations in accordance with 23 CFR 771.129. This document must include the project history, addressing the specific changes that have occurred, potential environmental impacts and why (or why not) the Categorical Exclusion (CE) or Finding of No Significant Impact (FONSI) designation remains valid.

All re-evaluation documents shall follow the most current format provided by the State's Environmental Division.

JJ. Reference Documents

The Engineer shall adhere to the content of the following reference documents in the development of the assigned documentation:

1. SOUs for CEs
2. SOUs for Programmatic Categorical Exclusion (PCEs)
3. SOUs for Written re-evaluations
4. The TxDOT On-Line Environmental Manual

General Standards for Surveying

All surveys shall meet or exceed the standards set in the Professional Land Surveying Practices Act, the General Rules of Procedures and Practices promulgated by the Texas Board of Professional Land Surveying (TBPLS), and the Texas Department of Transportation (TxDOT) TxDOT Survey Manual, latest edition, and shall be accomplished in an organized and professional manner, subject to the approval of the State.

The State's ROW Vol. 1 - Procedures Preliminary to Release, (online at: <http://onlinemanuals.txdot.gov/txdotmanuals/ppr/index.htm>) and the TxDOT Survey Manual, latest edition, will serve as a guide and shall be the basis for the format and preparation of all right-of-way documents produced, including Right-of-Way (ROW) maps, property descriptions (including parcel plats), and other Right-of-Way work products, unless otherwise specified by the State.

The North American Datum of 1983 (NAD83), Texas Coordinate System of 1983 (State Plane Coordinates), applicable to the zone or zones in which the work is performed, with values in U.S. Survey Feet, will be used as the basis for all horizontal coordinates derived, unless otherwise directed by the State. The datum adjustment currently in use by the State shall be utilized unless otherwise specified by the State.

Project or surface coordinates will be calculated by applying a Combined Adjustment Factor (CAF) to State Plane Coordinate values. The value utilized for a project may be directed by the State to: a) match existing or ongoing projects, b) conform to a county-wide surface adjustment factor, or c) be calculated specifically for the project area.

Elevations will be based on the North American Vertical Datum 88 (NAVD88), unless otherwise specified by the State.

All GPS work, whether primary control surveys or other, shall meet or exceed the current Federal Geodetic Control Subcommittee's (FGCS) Geometric Geodetic Accuracy Standards and Specifications for Using GPS Relative Positioning Techniques and the TxDOT Survey Manual, latest edition, to the order of accuracy specified in the categories listed below or in a work authorization. If the order of accuracy is not specified in this contract or in a work authorization, the work shall meet or exceed the order of accuracy specified in the publications listed in this paragraph.

All conventional horizontal and vertical control surveys shall meet or exceed the current FGCS Standards and Specifications for Geodetic Control Networks, the TxDOT Survey Manual, latest edition, and the Texas Society of Professional Surveyors (TSPS) Manual of Practice for Land Surveying in the State of Texas, latest edition, to the order of accuracy specified, and in the categories listed below or in a work authorization. If the order of accuracy is not specified in this

contract or in a work authorization, the work shall meet or exceed the order of accuracy specified in the publications listed in this paragraph.

In order to ensure accuracy and accountability of the services provided under this contract, the Engineer's Surveyor may be required to certify work performed under this contract as true and correct according to FGCS standards, the TxDOT Survey Manual, latest edition, or the TSPS Manual of Practice for Land Surveying in the State of Texas, as may be applicable.

The Engineer's Surveyor shall provide temporary signing and traffic control in and around survey operations; signing and traffic control will comply with provisions of the Texas Manual of Uniform Traffic Control Devices. All signs, flags and safety equipment shall be provided by the Engineer's Surveyor. As specified, the Public Information Office in the District Headquarters shall be notified 24 hours in advance of any lane closures.

The Engineer's Surveyor shall provide all personnel, equipment, and materials necessary for the performance of the activities required by this agreement or by any work authorization.

Survey Data (original and processed) shall be provided to the State on a compact disk or other approved medium and shall be fully compatible with the State's computer system and with programs in use by the State at the time of the submission, without further modification or conversion. The current program formats used by the State are: *Microsoft® Office Word 2010* for word processing, *MicroStation® V8i* and *GEOPAK Survey* for graphics applications. Data collection programs must be compatible with the current import formats allowed by *GEOPAK Survey* and be attributed with current Feature Codes. These programs may be replaced at the discretion of the State.

Variations from these software applications or other requirements listed above shall only be allowed if requested in writing by the Engineer's Surveyor and approved by the State.

The Engineer's Surveyor shall perform Quality Control/Quality Assurance on all procedures, field surveys, data, and products prior to delivery to the State. The State may also require the Engineer's Surveyor to review the survey work performed by other Surveyors. If, at any time, during the course of reviewing a submittal of any item it becomes apparent to the State that the submittal contains errors, omissions, and inconsistencies, the State may cease its review and return the submittal to the

Engineer's Surveyor immediately for appropriate action by the Engineer's Surveyor. A submittal returned to the Engineer's Surveyor for this reason is not a submittal for purposes of the submission schedule.

The Standards for services that are not boundary-related but that relate to surveying for engineering projects may be determined by the construction specifications, design specifications, or as specified by the State.

Specific Work To Be Performed

Project Locations

Surveying services provided will be for projects located as directed by the State.

SURVEYING SERVICES TO BE PROVIDED

Function Code 130 (130) – Right-of-Way Mapping

A. Right-of-Way Mapping

This includes the performance of on the ground surveys and preparation of parcel maps, legal descriptions (metes and bounds descriptions), and right-of-way maps.

1. Purpose

The purpose of right-of-way mapping is to prepare documents suitable for the acquisition of real property interests and the probable issuance of a title policy.

2. Definitions

For purposes of this Contract, the following definitions shall apply:

- a. Abstract Map (Working Sketch) – A drawing to scale prepared from record documents depicting proposed right-of-way lines, existing right-of-way lines, easement lines, and private property lines with relevant grantee names, recording data, and recording dates.
- b. Closure/Area Calculation Sheet – A computer generated print-out of the area and the perimeter bearings, distances, curve data, and coordinates of an individual parcel of land to be acquired.

- c. Access Denial Line – A line which indicates specific location where access to the roadway is denied.
- d. Property Description – A document prepared as an exhibit for the conveyance of a property interest, reflecting a boundary survey, signed and sealed by a Registered Professional Land Surveyor (RPLS), attached to an acquisition deed as Exhibit A, and consists of the following two parts:
 - 1) A written metes and bounds description delineating the area and the boundary and describing the location of an individual parcel of land unique to all other parcels of land.
 - 2) A parcel plat – An 8 ½ inch by 11 inch formatted drawing to scale depicting all the information shown on the right-of-way map regarding an individual parcel of land to be acquired.
- e. Owner – The most current title holder of record as determined by a study of the Real Property Records.
- f. Parent Tract – A unit or contiguous units of land under one ownership, comprising a single marketable tract of land consistent with the principle of highest and best use.
- g. A parent tract may be described by a single instrument or several instruments. A single parent tract cannot be severed by a public right-of-way, easement, or separate ownership which destroys unity of use.
- h. Parent Tract Inset – A small line drawing, to an appropriate scale, of the parent tract perimeter placed upon the right-of-way map in the proximity of the respective parcel. Parent tract insets are used in cases where the parent tract cannot be shown to the same scale as the right-of-way map. Since parent tract insets are used to identify the limits and location of parent tracts, they should include public right-of-ways, utility easements and fee strips, and identifiable water courses which bound the parent tract.
- i. Point of Beginning (P.O.B.) – A corner of the parcel of land to be acquired, located on the proposed right-of-way line and being the beginning terminus of the first course of the property description.
- j. Point of Commencing (P.O.C.) – A monumented property corner which can be identified in the Real Property Records and is located outside the proposed right-

of-way corridor. For title purposes, the point of commencing should be a monumented back corner of the parent tract. In the event a monumented back corner of the parent tract cannot be recovered, the nearest identifiable monumented property corner located outside the proposed right-of-way corridor may be used.

- k. Preliminary Right-of-Way Layout – A drawing to scale depicting proposed right-of-way lines, existing right-of-way lines, proposed pavement, access denial lines, the proposed centerline alignment, private property lines, easement lines, visible improvements, visible utilities, the station and offset from the centerline alignment to each Point of Curvature (PC), Point of Tangency (PT), and angle point in the proposed right-of-way lines and to each PC, PT, and angle point in the existing right-of-way lines in areas of no proposed acquisition.
- l. Right-of-Way Maps – A series of 22 inch by 34 inch drawings to scale depicting the results of relevant elements of records research, field work, analysis, computation, and map making required to determine title, delineate areas and boundaries, locate and describe utilities and improvements to the extent necessary to appraise the value and negotiate the acquisition of individual parcels of private land for a proposed right-of-way project.

3. Procedure

All standards, procedures and equipment used by the Engineer's Surveyor shall be such that the results of the survey will be in compliance with Board Rule 663.15 as promulgated by the Texas Board of Professional Land Surveying (TBPLS)

RULE §663.15 Precision and Accuracy

Survey measurements shall be made with equipment and methods of practice capable of attaining the accuracy and tolerances required by the professional land surveying services being performed.

Areas, if reported, shall be produced, recited, and shown only to the least significant number compatible with the precision of closure.

a. Abstract Map (Working Sketch)

The Engineer's Surveyor shall prepare an abstract map sufficient to determine the following:

- 1) Any and all interests of public record held in the land to be acquired.
- 2) The total record holdings of an owner contiguous to land to be acquired from that owner.
- 3) Any and all interests in land to be acquired held in common (shopping mall parking lots, subdivision reserves, and others)
- 4) Any and all improvements proposed by other agencies which may have a bearing on project development.
- 5) All called monuments, bearings, and distances as per recorded information.

b. Right-of-Way Map

The Engineer's Surveyor shall field locate property corners, existing right-of-way markers, improvements, visible utilities, verify and update the planimetric file, if provided, and as directed by the State.

The Engineer's Surveyor shall prepare a right-of-way map for each proposed right-of-way project. A right-of-way map shall include a title sheet, an index sheet, a survey control index sheet, a horizontal and vertical control data sheet, and sufficient plan sheets to cover the proposed project, or as directed by the State. The State has developed standard title sheets, index sheets, and plan sheets, copies of which the Engineer's Surveyor shall request and secure for all purposes of this Contract. Plan sheets shall include, but need not be limited to, the following items of information:

By mutual agreement between the TBPLS and TxDOT, right-of-way maps need not be signed and sealed by a RPLS.

- 1) Proposed right-of-way lines shall be delineated with appropriate bearings, distances, and curve data. Curve data shall include the radius, delta angle, arc length, and long chord bearing and distance.
- 2) Existing right-of-way lines shall be delineated with appropriate bearings, distances, and curve data to the extent necessary to describe the

individual parcels of land to be acquired. Curve data shall include the radius, delta angle, arc length, and long chord bearing and distance.

- 3) The proposed project baseline alignment shall be delineated with appropriate bearings, distances, and curve data. Curve data shall include the station of the curve Point of Intersection (PI), radius, delta angle, arc length, tangent length, long chord bearing and distance, and the N and E coordinates of the curve PI. All alignment PCs, PTs, and even 500 foot stations shall be labeled as to station.
- 4) Proposed paving lines combined with relevant existing paving lines shall be shown to the extent necessary to compile a complete picture of proposed traffic movements. Proposed paving on the final mylars submitted to the State shall be shaded with a dot pattern or highlighted by some other means acceptable to the State.
- 5) Access denial lines shall be shown sufficiently to indicate areas where access is to be denied and where access is to be permitted.
- 6) Private property lines shall be delineated with appropriate bearings, distances, and curve data to the extent necessary to describe the individual parcels of land to be acquired. Curve data shall include the radius, delta angle, arc length, and long chord bearing and distance.
- 7) League lines and survey lines shall be shown and identified by name and abstract number.
- 8) County lines and city limit lines shall be located and identified by name.
- 9) A north arrow shall be shown on each sheet, and, if possible, located in the upper right corner of the sheet.
- 10) 3.2.10 Monumentation set or found shall be shown and described as to material and size.
- 11) A station and offset shall be shown for each PC, PT, and angle point in the proposed right-of-way lines. Stations and offsets shall be with respect to the proposed centerline alignment.
- 12) Intersecting and adjoining public right-of-ways shall be shown and identified by name, right-of-way width, and recording data.

- 13) Railroads shall be shown and identified by name, right-of-way width, and recording data.
- 14) Utility corridors shall be identified as to easement or fee.
- 15) Easements and fee strips shall be shown and identified by width, owner, and recording data.
- 16) Building lines or set-back lines shall be shown and identified.
- 17) Visible improvements located within the proposed right-of-way corridor or within 50 feet of a proposed right-of-way line shall be shown and identified.
- 18) Structures shall be identified as commercial or residential, by number of stories, and as to type (brick, wood frame, metal, or stucco).
- 19) Structures which are severed by a proposed right-of-way line shall be dimensioned to the extent necessary to completely delineate the severed parts.
- 20) Parking areas, billboards, and other on-premise signs which are severed by a proposed right-of-way line shall be dimensioned to the extent necessary to delineate that portion of the parking area, billboard, or sign which is located within the proposed right-of-way corridor.
- 21) In cases where structures are located outside the proposed right-of-way corridor and within 10 feet of a proposed right-of-way line, the shortest distance between the structure and the proposed right-of-way line shall be shown.
- 22) If the structure is an element of the planimetric furnished to the Engineer's Surveyor by the State, the Engineer's Surveyor may snap to the structure to determine the shortest distance to the proposed right-of-way line. However, if the distance is less than 3 feet, it shall be field verified.
- 23) Visible utilities located within the proposed right-of-way corridor or within 50 feet of a proposed right-of-way line shall be shown and identified.
- 24) The location of underground fuel storage tanks situated within the proposed right-of-way corridor or within 50 feet of a proposed right-of-way line shall be determined and shown. The visible location of vents and filler caps in conjunction with available design and as-built drawings may be

used to determine a most probable location in the event an actual location is indeterminable.

- 25) Points of commencing and points of beginning shall be shown and labeled. Points of beginning shall be shown with their respective N and E surface coordinates. As an exception, a point of commencing will not be required in the case of a total taking without a remainder.
- 26) Each parcel of land to be acquired shall be identified by a parcel number which shall appear in the ownership tabulation and on the right-of-way map in the proximity of the respective parcel. If the Engineer's Surveyor is unfamiliar with the criteria used by the State to assign parcel numbers, the Engineer's Surveyor shall seek the assistance of the State at the time the abstract map is complete.
- 27) An ownership tabulation shall be shown which shall include the parcel number, existing area of the parent tract, lot(s) and block(s) constituting the parent tract when applicable, owner's name, type of conveyance, film code, county clerk's file number, taking area, and remaining area of the parent tract located left and right of the centerline alignment. Types of conveyance, film code and file numbers refer to conveyances into the State and will be added to the right-of-way map by the State at a later date. Several blank lines shall be provided in the tabulation block to facilitate future map additions.
- 28) A parent tract inset shall be shown for each parent tract which cannot be shown to scale on the right-of-way map. The use of broken scale lines should be avoided. When parent tract insets are used, the point of commencing with the appropriate bearing and distance to the point of beginning may be shown on the parent tract inset.
- 29) A note shall be included on the title sheet and each map sheet stating the source of bearings, coordinates, and datum used. The note shall also include the National Geodetic Survey (NGS) or other basis monument(s) name or identification number, State Plane Coordinate zone information, Grid or Surface values and the Combined Adjustment Factor or Surface Adjustment Factor.

- 30) Appropriate notes shall be included on the title sheet and each map sheet stating the following:
- 31) Month(s) and year abstracting upon which the map is based.
- 32) Month(s) and year field surveys were conducted upon which the map is based.
- 33) Month and year the map was completed by the Engineer's Surveyor.
- 34) The right-of-way Control-Section-Job (CSJ) number, if available, shall be shown on each right-of-way map sheet.
- 35) Place four (4) Tick Marks in each quadrant of the map sheet, based on surface coordinates, with Latitude and Longitude (Lat/Long). The tick marks may be placed on the match lines of each map sheet, if convenient. A foot note shall also be placed on the sheet defining the tick marks as Lat/Long in Decimal Degrees.

c. Exhibits

The Engineer's Surveyor shall prepare a Property Description for each parcel or tract consisting of two (2) parts: (1) a metes and bounds description of the property and (2) a parcel plat. Each part of a Property Description shall be signed and sealed by a RPLS.

1) Metes and bounds description

A metes and bounds description shall be prepared for each parcel of land to be acquired. The State has developed standard formats for metes and bounds descriptions, copies of which the Engineer's Surveyor shall request and secure for all purposes of this Contract. Metes and bounds descriptions shall include, but need not be limited to, the following items of information:

- a. State, County, and Survey within which the proposed parcel of land to be acquired is located.
- b. A reference to unrecorded and recorded subdivisions by name, lot, block, and recording data to the extent applicable.
- c. A reference by name to the grantor and grantee, date and recording data of the most current instrument(s) of conveyance describing the parent tract.

It is the preference of the State to use execution dates in deed references as opposed to recording or filing dates. In any case, the metes and bounds description shall make clear which date is being used.

- d. A point of commencing.
- e. A point of beginning with the appropriate N and E surface coordinates.
- f. A series of courses, identified by number and proceeding in a clockwise direction, describing the perimeter of the parcel of land to be acquired, and delineated with appropriate bearings, distances, and curve data.

Curve data shall include the radius, delta angle, arc length, and long chord bearing and distance.

Each course shall be identified either as a proposed right-of-way line, an existing right-of-way line, or a property line of the parent tract. Each property line of the parent tract shall be described with an appropriate adjoiner call.

- g. A description of all monumentation set or found shall include, as a minimum, size and material.
- h. A reference to the source of bearings, coordinates, and datum used.

2) Parcel plat

A parcel plat shall be prepared for each parcel of land to be acquired. The State has developed standard formats for parcel plats, copies of which the Engineer's Surveyor shall request and secure for all purposes in this Contract. Parcel plats shall include each and every item of information shown on the right-of-way map which concerns the individual parcel.

4. Adherence to Standards

For purposes of clarity, consistency, and ease of understanding, the State, as an acquiring agency of private property for public use, has adopted standards and formats for right-of-way mapping which have proven to facilitate the processes of negotiation, appraisal, relocation assistance, and condemnation. It shall be the responsibility of the

Engineer's Surveyor to adhere to these standards and formats to every extent possible to ensure that the needs of the State are met.

5. General Specifications

For purposes of this Contract, the following general specifications for right-of-way mapping shall apply:

- a. Completed right-of-way maps shall be submitted to the State on single or double matte mylar, 22 inches by 34 inches in size with a 21 inch by 32 inch printed border positioned $\frac{1}{2}$ inch from the top, bottom, and right edge of the sheet.
- b. Parcel plats shall be submitted to the State on 8 $\frac{1}{2}$ inch by 11 inch bond paper with respective borders of 7 $\frac{1}{2}$ inches by 10 inches, positioned $\frac{1}{2}$ inch from the top, bottom, and right edge of the sheet. Match lines shall be used where more than one sheet is required.
- c. Right-of-way maps shall be drawn to a scale of 1 inch = 50 feet. An appropriate scale other than 1 inch = 50 feet may be used on some proposed right-of-way projects upon prior approval by the State.
- d. Since right-of-way maps are reduced in size by one-half for archiving purposes, the smallest size lettering acceptable on a right-of-way map shall be $\frac{1}{10}$ of one inch (Leroy #100). A right-of-way map which contains any lettering smaller than $\frac{1}{10}$ of one inch will not be accepted by the State.
- e. 5.5. Parcel plats shall be drawn to a preferred scale of 1 inch = 50 feet. An appropriate scale other than 1 inch = 50 feet may be used on some proposed right-of-way projects upon prior approval by the State. In the case of a very large parcel which would be difficult to show with clarity on a single 8 $\frac{1}{2}$ inch by 11 inch sheet, the Engineer's Surveyor shall use multiple 8 $\frac{1}{2}$ inch by 11 inch sheets with matching lines.
- f. The smallest size lettering acceptable on a parcel plat shall be 0.06 of an inch (Leroy #60).
- g. Property descriptions shall be submitted on 8 $\frac{1}{2}$ inch by 11 inch bond paper.
- h. The State has encountered a number of mylar products which are considered unacceptable. Prior to using a new mylar product, the Engineer's Surveyor shall obtain approval by the State.

- i. Zip-A-Tone or other similar stick-on products shall not be used on right-of-way maps or parcel plats.

6. General Requirements

For purposes of this Contract, the following general requirements shall apply:

- a. Copies of instruments of record submitted to the State shall be indexed by parcel number.
- b. Coordinates appearing on right-of-way maps, on parcel plats, and in property descriptions shall be surface coordinates based on the Texas Coordinate System. The appropriate combined adjustment factors (sea level factor multiplied scale factor) for each zone of the coordinate system, which have been developed by the State, shall be noted.

In order to obtain surface coordinates; grid coordinates are multiplied by the appropriate combined adjustment factor for each zone, as provided by the State. (grid coordinates multiplied by the combined adjustment factor = surface coordinates).

- c. Line and curve tables may be used when necessary.
- d. The number of centerline alignment stations to be shown on a single plan sheet shall be restricted to the extent necessary to allow approximately 4 inches between match lines and sheet borders for future details and notes.
- e. A minimum 4 inch by 4 inch space shall be reserved at the bottom right corner of each map sheet for future revision notes.
- f. Based on the discretion and direction of the State, a 5/8 inch Iron Rod with a TxDOT Aluminum Cap (or other appropriate monument) may be set on the proposed right-of-way line, and may be replaced at a later date with a TxDOT Type II right-of-way marker.

When a TxDOT 5/8" iron rod with a TxDOT Aluminum Cap is set for PCs, PTs, PIs, and 1500 foot stations, the double asterisk symbol (**) shall be shown on the map sheets, written into, and shown in the property description, and shall be accompanied by following note:

****The monument described and set may be replaced with a TxDOT Type II right-of-way marker upon the completion of the construction project, under the supervision of a RPLS, either employed or retained by the State.**

7. Right-of-Way Maps Deliverables

In preparing right-of-way maps, the following will be required:

- a. An Abstract Map (Working Sketch) of the current record title holders.
- b. A Preliminary Map showing the proposed schematic and existing right-of-way.
- c. A Right-of-Way map for the project limits under cover of Title Sheet, Index Sheet, Control Data Sheet, and Exhibits of the property descriptions and parcel plats.
- d. Documentation stating that the appropriate monuments were set on the proposed right-of-way lines at intersecting property lines, and at all PCs, PTs, angle points, intersecting right-of-way lines of side streets, and at 1,500 foot stations.
- e. Documentation stating that the appropriate monuments were set on the existing right-of-way lines in areas of no acquisition at all PCs, PTs, angle points, and 1,500 foot stations, and as directed by the State.
- f. An Engineer's Surveyor's report, outlining the approach, reasons or basis for the existing right-of-way determination, and conclusions made.
- g. A copy of the State's right-of-way mapping check list, signed by the Engineer's Surveyor.
- h. GIS and Electronic Mapping submission requirements, detailed hereinafter.

8. GIS SUBMISSION REQUIREMENTS AND STANDARDS

All ROW Mapping project work authorizations shall be subject to these submission requirements and standards.

- a. The required geo-referenced parcel data (features) will be submitted in ArcGIS 10 format or the current version in use by the State and in the format of the ROW Geo-Database Template "ROW_Parcels_Edits", which will be provided by TxDOT.
- b. The template will also be available to download from the ROW Division's webpage on TxDOT's internet site (txdot.gov), along with more detailed requirements.

- c. The template's NE Coordinate System is Geographic coordinates (longitude and latitude), North American Datum of 1983 in Decimal Degrees (8 or more place after the decimal point).
- d. The data must be geospatially correct and submitted to the State in the exact format of the template.

9. Electronic Right-of-Way Mapping Standards

The primary purpose of this section is to provide guidelines for the graphics standards and file management (structure and naming conventions) of right-of-way mapping electronic deliverables submitted to the State's Right-of-Way Division by the Districts, Regions, other Divisions and Consultants as an integral part of the right-of-way mapping package.

The software, file types and file formats must be compatible with those used by the District/Division Design for Schematics and PS&E, example: native *MicroStation® V8i* files for graphics and *Microsoft® Office Word 2010* for metes and bounds descriptions.

a. *MicroStation® V8i*

All graphic files for Map Sheets and Parcel Plats must be native DGN files created by *MicroStation® V8i* using the State's current seed files in the State's workspace environment, settings, and resource files.

b. Level Library Files

MicroStation® V8i has an unlimited number of levels and uses logically descriptive names for the features on that level instead of level numbers. Each level can have a predefined line type, line weight, line color, text font, text weight, and text color. The *MicroStation® V8i* Level Library File (file_name.dgnlib) is a file that contains predefined levels. When attached in the Level Manager it loads these predefined levels into the current DGN file.

The State's current Level Library Files for right-of-way mapping will be provided by the State. The file(s) contains all the predefined levels that will normally be needed for right-of-way mapping and to show existing utilities.

c. Separate DGN Files for Each Map Sheet

To have each right-of-way map sheet spatially correct (snapping on elements gives correct coordinate values), there should be one (1) DGN file for each map sheet. This allows multiple users to work on different sheets at the same time from a server in production, with all the sheets utilizing the same master reference files. (Note: It is possible to have all the sheets in one DGN, but only one person at a time would be able to work on the project.)

The sheet file naming convention is "ROW CSJ_Sheet Number.dgn", with an example as follows: "212104065_S01.dgn"

In the example above, the first nine (9) numbers "212104065" is the right-of-way CSJ for the project and "S01" is the sheet number, beginning with number 1 as the cover sheet.

- d. Format of the MDF/MRF (Master Design File or Master Right-of-Way Files) DGN Reference Files and Map Sheet Naming Conventions

Since the recommended naming prefix for design files is MDF (Master Design File), the prefix should be different for the right-of-way files since the location of the existing and proposed right-of-way in the design files from the schematic will change to some degree after an on the ground survey is made for right-of-way mapping. Therefore, the prefix could be MRF for Master Right-of-Way File.

The corrected Master Right-of-Way Files will be given to the design engineer to be used in the final PS&E so that all features of construction and the relocation of utilities will be correctly placed in relation to the highway right-of-way and the right-of-way of cross streets or roadways.

The Master Right-of-Way File naming convention is: "MRF ROW CSJ_Logical Name.dgn", with examples as follows: MRF212104065_Schematic90.dgn (Schematic layout 90% submittal);

MRF212104065_Schematic100.dgn (Schematic layout 100% submittal);
MRF212104065_SchemApprov.dgn (Final Approved [State & FHWA])

Schematic); MRF212104065_PSEDesign.dgn (Final P.S.&E. Design);
MRF212104065_ExROW.dgn (Existing right-of-way determined by RPLS);
MRF212104065_PropROW.dgn (Proposed right-of-way of final design);
MRF212104065_DeedPlot.dgn (Deed Record);
MRF212104065_Planimetric.dgn (Aerial mapping topography);
MRF212104065_ROWTopo.dgn (Improvements data collection);
MRF212104065_DesignTopo.dgn (Design level data collection topography);
MRF212104065_ExUtil.dgn (Existing utilities)

All sheet files with a plan view will have the MRF referenced to allow more than one sheet file to be worked on at the same time.

e. File Structure of Master and Reference DGN Files

The State's preference is to have no subfolders, if possible, to allow better transfer of data to different PC or server drive names or CD/DVD's without path problems to reference files when the sheet files are opened.

f. Lines Weights, Line Styles, Colors, Text Size, Text Fonts, Scale, and Annotations

Legibility is the primary concern when choosing the scale, line weights and text size. Not only should the sheets be legible at full scale sheet size (22 inches x 34 inches), they should be completely legible at half scale sheet size (11 inches x 17 inches). Even if the originals or first generation plots are legible, the reproductions (copies) must also be legible.

The normal scales for the full scale sheet size must be 1 inch = 50 feet (urban) and 1 inch = 100 feet (rural), which will be 1 inch = 100 feet and 1 inch = 200 feet, respectively, when plotted or reduced to the half scale sheet size.

Minimum line weights, text size and text font will be dictated by legibility at half scale sheet size (11 inches x 17 inches). Even if the originals or first generation plots are legible, the reproductions (copies) must also be legible.

Standard cell library: TxdotSurv_04.cel or current State cell files; Standard Font: 1 Leroy; and standard State color tables: V256COLR.ctb or Txgpk.ctb.

Use the State's current *GEOPAK Survey* SMD file that sets up new feature codes in SMD file for alignment chains, parcel chains and survey chains that can be drawn by *GEOPAK Survey* from the GPK file with the correct line styles, colors and weights to the designated levels loaded into the dgn by the State's current level library files.

Use *MicroStation® Packager* for the submission of electronic deliverables, which would capture any non-State standard rsc, cel, text, and text color files that were used in the mapping that look and plot differently in the State's *MicroStation® V8i* workspace.

- g. Text and Line Colors When Using Color Digital Orthoimagery in the Background
The predominate colors of the digital orthoimagery (greens, browns, and others) will dictate the line and text colors that stand out and are legible. Some degree of trial and error is sometimes needed.
- h. Required Data in the *GEOPAK* Right-of-Way GPK File
Alignments, chains of proposed and existing right-of-way lines, parent tracts and taking parcels, all points collected in the field (start with schematic or design GPK file) are required.

If the design GPK file is too detailed for right-of-way use, input files can be created for just the information sought from the design GPK file to load into the right-of-way GPK file.
- i. Surface Coordinate and the Future ROW GIS Data Base
Surface adjustment factors and basis of datum should be well documented in the electronic deliverables "file structure/deliverables read me" file.
- j. Requirements for Electronic Deliverables

Native *MicroStation® V8i* DGN files (reference files, sheets files, and parcel plats files);

GEOPAK Survey GPK files;

Separate comma delimited point files (ASCII text file) and .csv file in the following types of coordinates: Surface or Project Coordinates, Grid Coordinates (Texas Coordinate System of 1983 in U.S. Survey feet) and Geographic Coordinates (WGS-84 in decimal degrees) in the following format: point number, northing or latitude, easting or longitude, elevation, feature code, description. Text/.csv point file naming convention is: ROW CSJ_Type of Coordinates.csv (Example: 212101065_Surface.csv, 212101065_Grid.csv, and 212101065_WGS84.csv);

PDF's created in *MicroStation® V8i* of Map Sheets (both 22 inches x 34 inches and 11 inches x 17 inches, one set in black and white and another set in color if there is orthoimagery for the background;

PDF's of signed and sealed Property Descriptions, Parcel Plats, and Engineer's Surveyor's Reports and *Microsoft® Office Word 2010* documents of Property Descriptions and Engineer's Surveyor's Reports;

Raw and processed GPS files including adjustment reports.

Function Code 160 (150) – Design Surveys and Construction Surveys

A. Design Surveys and Construction Surveys

This includes performance of surveys associated with the gathering of survey data for topography, cross-sections, and other related work in order to design a project, or during layout and staking of projects for construction.

a. Purpose

The purpose of a design survey is to provide field data in support of transportation systems design.

The purpose of a construction survey is to provide field data in support of highway construction.

b. Definitions

A design survey is defined as the combined performance of research, field work, analysis, computation, and documentation necessary to provide detailed topographic (3-dimensional) mapping of a project site. A design survey may include, but need not be limited to locating existing right-of-way, cross-sections or data to create cross-sections and Digital Terrain Models (DTM), horizontal and vertical location of utilities and improvements, detailing of bridges and other structures, review of right-of-way maps, and other establishing control points.

A construction survey is defined as the combined performance of reconnaissance, field work, analysis, computation, and documentation necessary to provide the horizontal and vertical position of specific ground points to be used by the construction contractor for determining lines and grades.

c. Tasks to be Completed

a. Design Surveys

The State will request design surveys on an as needed basis. The surveys shall include, but are not limited to the following:

The Engineer's Surveyor shall:

- 1) Obtain or collect data to create cross-sections and digital terrain models.
- 2) Locate existing utilities.
- 3) Locate topographical features and existing improvements.
- 4) Provide details of existing bridge structures.
- 5) Provide details of existing drainage features, such as culverts and manholes.
- 6) Locate wetlands.
- 7) Establish additional and verify existing control points. Horizontal and Vertical control ties should be made and tabulated, to other control points in the vicinity, which were established by other sources such as, the National Geodetic Survey (NGS), and the Federal Emergency Management Agency (FEMA), and as directed by the State.
- 8) Locate existing right-of-ways.
- 9) Review right-of-way maps.
- 10) 3.1.10. Locate boreholes.

- 11) 3.1.11. Perform hydrographic surveys.
- 12) 3.1.12. Update existing control data and prepare survey control data sheets, as directed by the State for inclusion into a construction plan set.

The Engineer's Surveyors shall also prepare a *Survey Control Index Sheet* and a *Horizontal and Vertical Control Sheet*, signed, sealed and dated by the professional engineer in direct responsible charge of the surveying and the responsible RPLS for insertion into the plan set. The *Survey Control Index Sheet* shows an overall view of the project control and the relationship or primary monumentation and control used in the preparation of the project; whereas, the *Horizontal and Vertical Control sheet* identifies the primary survey control and the survey control monumentation used in the preparation of the project. Both the *Survey Control Index Sheet* and the *Horizontal and Vertical Control Sheet* should be used in conjunction with each other.

The following information will be shown on the *Survey Control Index Sheet*:

- Overall view of the project and primary control monuments set for control of the project
- Identification of the control points
- Baseline or centerline
- Graphic (Bar) Scale
- North Arrow
- Placement of note "*The survey control information has been accepted and incorporated into this PS&E*" which will be signed, sealed and dated by a Texas Professional Engineer employed by the State
- RPLS signature, seal, and date
- TxDOT title block containing District Name, County, Highway, and CSJ

The following information will be shown on the *Horizontal and Vertical Control Sheet*:

- Location for each control point, showing baseline or centerline alignment and North arrow.

- Station and offset (with respect to the baseline or centerline alignments) of each identified control point.
- Basis of Datum for horizontal control (base control monument/benchmark name, number, datum).
- Basis of Datum for the vertical control (base control monument, benchmark name, number, datum).
- Date of current adjustment of the datum.
- Monumentation set for Control (Description, District name/number and Location ties).
- Surface Adjustment Factor and unit of measurement.
- Coordinates (State Plan Coordinates [SPC] Zone and surface or grid).
- Relevant metadata.
- Graphic (Bar) Scale.
- Placement of note *"The survey control information has been accepted and incorporated into this PS&E"* which will be signed, sealed and dated by a Texas Professional Engineer employed by the State.
- RPLS signature, seal and date.
- TxDOT title block containing District Name, County, Highway, and CSJ.

b. Construction Surveys

The State will request construction surveys on an as needed basis. The surveys will include, but are not limited to the following:

The Engineer's Surveyor shall:

- 1) Stake existing or proposed right-of-ways.
- 2) Stake existing or proposed baseline/centerline.
- 3) Stake proposed bridge structures.
- 4) Stake proposed drainage structures, such as manholes and culverts.
- 5) Set grade stakes.
- 6) Recover and check existing control points.
- 7) Establish additional control points.
- 8) Check elevations and locations of structures.

- 9) Determine and resolve conflicts associated with survey data.

4. Technical Requirements

- a. Design surveys and construction surveys shall be performed under the supervision of a RPLS currently registered with the TBPLS.
- b. Horizontal ground control used for design surveys and construction surveys, furnished to the Engineer's Surveyor by the State or based on acceptable methods conducted by the Engineer's Surveyor, shall meet the standards of accuracy required by the State.

Reference may be made to standards of accuracy for horizontal control traverses, as described in the FGCS Standards and Specifications for Geodetic Control Networks, latest edition, the TxDOT Survey Manual, latest edition, or the TSPS Manual of Practice for Land Surveying in the State of Texas, as may be applicable.

- c. Vertical ground control used for design surveys and construction surveys, furnished to the Engineer's Surveyor by the State or based on acceptable methods conducted by the Engineer's Surveyor, shall meet the standards of accuracy required by the State.

Reference may be made to standards of accuracy for vertical control traverses, as described in the FGCS Standards and Specifications for Geodetic Control Networks, latest edition, the TxDOT Survey Manual, latest edition, or the TSPS Manual of Practice for Land Surveying in the State of Texas, as may be applicable.

- d. Side shots or short traverse procedures used to determine horizontal and vertical locations shall meet the following criteria:
 - 1) Side shots or short traverses shall begin and end on horizontal and vertical ground control as described above.
 - 2) Standards, procedures, and equipment (may be GPS Equipment, LiDAR, or Total Stations) used shall be such that horizontal locations relative to the control may be reported within the following limits:
 - i. Bridges and other roadway structures: less than 0.1 of one foot.

- ii. Utilities and improvements: less than 0.2 of one foot.
 - iii. Cross-sections and profiles: less than 1 foot.
 - iv. Bore holes: less than 3 feet.
- 3) Standards, procedures, and equipment (may be GPS Equipment, LiDAR, or Total Stations) used shall be such that vertical locations relative to the control may be reported within the following limits:
- 1. Bridges and other roadway structures: less than 0.02 of one foot.
 - 2. Utilities and improvements: less than 0.1 of one foot.
 - 3. Cross-sections and profiles: less than 0.2 of one foot.
 - 4. Bore holes: less than 0.5 of one foot.

5. Deliverables

The deliverables to be specified in individual work authorizations for design surveys and construction surveys may be any combination of the following:

- a. Digital Terrain Models (DTM) and the Triangular Irregular Network (TIN) files in a format acceptable by the State.
- b. Maps, plans, or sketches prepared by the Engineer's Surveyor showing the results of field surveys.
- c. Computer printouts or other tabulations summarizing the results of field surveys.
- d. Digital files or media acceptable by the State containing field survey data.
- e. Maps, plats, plans, sketches, or other documents acquired from utility companies, private corporations, or other public agencies, the contents of which are relevant to the survey.
- f. Field survey notes, as electronic and hard copies.
- g. An 8 ½ inch by 11 inch survey control data sheet for each control point which shall include, but need not be limited to, a location sketch, a physical description of the point including a minimum of two reference ties, surface coordinates, a surface adjustment factor, elevation, and the horizontal and vertical datums used.
- h. A digital and hard copy of all computer printouts of horizontal and vertical conventional traverses, GPS analysis and results, and survey control data sheets.
- i. Survey reports in a format requested by the State.

6. Automation Requirements

- a. Planimetric design files (DGN) shall be fully compatible with the State's *MicroStation® V8i* graphics program without further modification or conversion.
- b. Electronically collected and processed field survey data files shall be fully compatible with the State's computer systems without further modification or conversion. All files shall incorporate only those feature codes currently being used by the State.
- c. DTM shall be fully compatible with the State's *GEOPAK* system without further modification or conversion. All DTM fully edited and rectified to provide a complete digital terrain model with all necessary break lines.

Function Code 160 (150) – Aerial Mapping

A. Aerial Mapping

This involves the collection and reduction of aerial survey data, and preparation of site maps and topographic maps.

a. Purpose

The purpose of aerial mapping is to provide planimetric digital mapping (DGN) and DTM in support of roadway design.

b. Definitions

For purposes of this Contract, the following definitions shall apply:

- a. Aerial Photograph – A vertical photograph taken from an aircraft at an altitude above mean terrain elevation to produce a photo scale of 1:3,000.
- b. Aerotriangulation – The process of expanding a skeletal network of ground control points to provide the dense control network to reference each individual photogrammetric stereo model to the actual ground.
- c. Box Panel – A center panel point which is paneled in a specific manner and is used to mark the beginning or end of a flight tangent.
- d. Center Panel – A panel point located generally in the vicinity of the geometric centerline of the project for which the coordinate location and elevation are required.

- e. Contact Print – A print of a film negative on photographic paper.
 - f. DGN – A two or three dimensional graphics file produced by *MicroStation® V8i*. These files can contain features and improvements plotted in a horizontal plane along the N and E axes which correspond to Texas State Plane Coordinates. These files can contain 2D or 3D elements representing topographic, existing, proposed, schematic, and general layout features.
 - g. Digital terrain Model (DTM) – A three dimensional digital model of the ground containing those features necessary to define surface relief. A three dimensional model does not normally contain those planimetric features not necessary to define relief.
 - h. Film Negative – Developed exposed film.
 - i. Flight Map – A map depicting the alignment and termini of the flights required.
 - j. Horizontal and Vertical Ground Control – Survey control points for which the N and E coordinate and elevation have been determined by on-the-ground surveys.
 - k. Low Altitude Photography – Generally flown at 1,500 feet above mean terrain to obtain a 1:3,000 photo scale.
 - l. Medium Altitude Photography – Generally flown at 6,000 feet above mean terrain to obtain a 1:12,000 photo scale.
 - m. Planimetric Map – A two dimensional map containing natural ground features and improvements plotted in a horizontal plane along the N and E axes. A planimetric map does not include relief elements such as spot elevations, cross-sections, or contours.
 - n. Project Photo Length – The distance over which photographs are required to be taken.
 - o. Wing Panel – A panel point located generally in the vicinity of a perimeter line of the project for which the N and E coordinates and elevations are required.
3. Tasks to be Completed
- a. Aerial Photography
The Engineer's Surveyor shall provide aerial photography for low altitude aerial mapping appropriate for detailed design.
 - 1) Ground Control Accuracy Standards

- a. The Engineer's Surveyor shall provide horizontal ground control that meets standards of accuracy required by the State and as described in the FGCS Standards and Specifications for Geodetic Control Networks, latest edition, the TxDOT Survey Manual, latest edition, or the TSPS Manual of Practice for Land Surveying in the State of Texas, as may be applicable.
 - b. The Engineer's Surveyor shall provide vertical ground control that meets standards of accuracy required by the State and as described in the FGCS Standards and Specifications for Geodetic Control Networks, latest edition, the TxDOT Survey Manual, latest edition, or the TSPS Manual of Practice for Land Surveying in the State of Texas, as may be applicable.
- 2) Deliverables
- i. Uncut film, labeled as to county, highway, date of flight, photograph panel number, and photograph scale, delivered in a protective canister.
 - ii. Contact prints (two (2) complete sets). May be substituted by Orthoimagery.
 - iii. Certification that the photographs were taken on the date indicated, signed by the airplane pilot or aerial photographer.
 - iv. Photo index and scanned digital imagery of each frame of photography on CD or DVD.
- 3) Paneling Placement Specifications
- For purposes of this Contract, all standards and specifications will be in accordance with established guidelines and recommended or approved by the State.
- 4) Aerial Photography Standards and Specifications
- For purposes of this Contract, all standards and specifications will be in accordance with established guidelines and recommended or approved by the State.
- 5) LiDAR Technology

The use of LiDAR Technology (mobile, terrestrial or aerial) is acceptable when approved by the State and the accuracies of the specified tasks it will be used for, are met or exceeded.

b. DGN, DTM, and TIN Files

The Engineer's Surveyor shall prepare DGN, DTM and TIN files covering the specific work location, meeting standards and specifications as required.

1) Horizontal Ground Control Accuracy Standards

The Engineer's Surveyor shall provide horizontal ground control that meets standards of accuracy required by the State and as described in the FGCS Standards and Specifications for Geodetic Control Networks, latest edition, the TxDOT Survey Manual, latest edition, or the TSPS Manual of Practice for Land Surveying in the State of Texas, as may be applicable.

2) Vertical Ground Control Accuracy Standards

The Engineer's Surveyor shall provide vertical ground control that meets standards of accuracy required by the State and as described in the FGCS Standards and Specifications for Geodetic Control Networks, latest edition, the TxDOT Survey Manual, latest edition, or the TSPS Manual of Practice for Land Surveying in the State of Texas, as may be applicable.

3) Map Accuracy Standard

The State's map accuracy standard is Class 1 of the American Society for Photogrammetry and Remote Sensing (ASPRS) Specifications and Standards Committee Standards for Large-Scale Maps (ASPRS 1990).

The State's map accuracy standard allows production of photogrammetrically derived maps to adhere to the Class 1 ASPRS standard without the necessity of a field check provided the proper equipment and procedures are used.

4) Statement of Map Accuracy

For maps that are not field checked but have been compiled to meet the State's accuracy standard, the following statement shall be included on the delivered hard copy and digital versions of the map:

"This map was compiled to meet the ASPRS Standard for Class 1 map accuracy."

If the map was checked and found to conform to this spatial accuracy standard, the statement above and the following statement shall also be included on the delivered hard copy and digital versions of the map, and in the field check summary:

"This map was checked and found to conform to the ASPRS Standard for Class 1 map accuracy."

- 5) Deliverables
 - a. DGN, DTM and TIN files on a medium and in a format acceptable to the State, delivered on CD or DVD.
 - b. Orthophotography (created using the DTM) delivered on CD or DVD in tiff format (three (3) banded) with world files. If digital, depending on intended use, deliverable formats include:
 - i. Raw tiff image – rectified – four (4) Band Tiff (for archive only).
 - ii. Color photography – rectified – three (3) Band Tiff and/or Mr. Sid.
 - iii. Infrared Photography – rectified – three (3) Band Tiff and/or Mr. Sid.
 - c. The State's *Photogrammetry Mapping Legend* and supplements, by the Engineer's Surveyor.
- 6) DGN File Specifications
 - a. Files shall be fully compatible with the State's *MicroStation®* graphics system without further modification or conversion.
 - b. File features and level structure shall be in compliance with the State's current *Photogrammetry Mapping Legend*.
 - c. Files shall be capable of plotting maps to a 1 inch = 50 feet scale with the smallest text size being one tenth of one inch (1/10").
- 7) DTM and TIN Files Specifications
 - a. Files shall be fully compatible with the State's *GEOPAK* graphics system without further modification or conversion.

- b. File features and level structure shall be in compliance with the State's current *Photogrammetry Mapping Legend*.
- c. Files shall be capable of plotting maps to a 1 inch = 50 feet scale with the smallest text size being one tenth of one inch (1/10").

Function Code 160 (150) – Horizontal and Vertical Control for Aerial Mapping

A. Horizontal and Vertical Control for Aerial Mapping

This involves the establishment of the horizontal and vertical control for aerial mapping.

a. Purpose

The purpose of an aerial photography control survey is to provide ground control in support of aerial Photogrammetry.

b. Definitions

An aerial photography control survey is defined as the combined performance of reconnaissance, field work, analysis, computation, and documentation necessary to provide the horizontal and vertical position of specific ground points to be used in setting the scale of aerial photographs and determining the relative position of elements visible in said photographs.

c. Tasks to be Completed

The following is an outline of the tasks to be performed. The Engineer's Surveyor shall:

- a. Prepare and submit a Panel Layout showing the proposed control and offsite control points, panel points, and wing points for approval by the State.
- b. Establish and determine the coordinates of the offsite and control points, panel points, and wing points.
- c. Establish and determine the elevations of the offsite and control points, panel points, and wing panels.
- d. Place panel material at the established points and maintain until the photographs from the flight are approved.
- e. Prepare, to scale, a Survey Control Index Sheet, a Horizontal and Vertical Control Sheet, and an individual control data sheet for each center and offsite control point.

4. Deliverables

The Engineer's Surveyor shall:

- a. Submit a final panel layout showing the location of the center and wing panel points and labeled with their respective alpha-numeric designations.
 - b. Submit a plot and computer graphics of an 11 inch by 17 inch index map showing an overall view of the project and the relationship of primary monumentation and control used in the preparation of the project, signed and sealed by a RPLS, and as directed by the State.
 - c. Submit a plot and computer graphics of an 11 inch by 17 inch horizontal and vertical control sheet showing the primary survey control monumentation used in the preparation of the project, signed and sealed by a RPLS, and as directed by the State.
 - d. Submit an 8 ½ inch by 11 inch data sheet for each center panel point which shall include, but need not be limited to, a location sketch, a physical description of the point, surface coordinates, the elevation, and datums used.
 - e. Submit a CD containing the graphics files and scanned images of the control data sheets.
 - f. Submit a written statement describing the datum used along with copies of all relevant NGS and data sheets.
 - g. Submit a written tabulation of all panel points with their respective alpha-numeric designations, surface coordinates (for center panel points only), and elevations.
5. Technical Requirements
- a. Aerial photography control surveys shall be performed by the Engineer's Surveyor under the direct supervision of a RPLS currently registered with the TBPLS.
 - b. The coordinate location of center panel and wing panels based on acceptable methods, conducted by the Engineer's Surveyor, shall meet the standards of accuracy as set forth below:

Reference may be made to standards of accuracy for horizontal control traverses, as described in the FGCS Standards and Specifications for Geodetic Control Networks, latest edition, the TxDOT Survey Manual, latest edition, or the TSPS Manual of Practice for Land Surveying in the State of Texas, as may be applicable.

- c. The elevation of center panel points and wing panel points based on acceptable methods, conducted by the Engineer's Surveyor, shall meet the standards of accuracy as set forth below:

Reference may be made to standards of accuracy for horizontal control traverses, as described in the FGCS Standards and Specifications for Geodetic Control Networks, latest edition, the TxDOT Survey Manual, latest edition, or the TSPS Manual of Practice for Land Surveying in the State of Texas, as may be applicable.

- d. The elevation of wing panel points based on side shots or short traverses shall meet the following criteria:
 - 1) Side shots or short traverses shall begin and end on vertical ground control as described above.
 - 2) Standards, procedures, and equipment used shall be such that the vertical location relative to the control may be reported to within 0.02 of one foot.

6. Automation Requirements

Post processing of field data shall be reviewed by the State. Data processed by standard calculators, computers, and other business hardware and software normally maintained and used by the Engineer's Surveyor shall be considered acceptable.

Function Code 130 (130) – State Land Surveying

A. State Land Surveying

This includes the performance of land surveying associated with "the location or relocation of original land grant boundaries and corners; the calculation of area and the preparation of field note descriptions of both surveyed and un-surveyed land or any land in which the State or the Public Free School Fund has an interest; the preparation of maps showing such survey results; and the field notes and maps of which are to be filed in the General Land Office," as quoted in the Surveyors Act.

a. Purpose

The purpose of state land surveying is to survey all State owned real property under the management of the General Land Office (GLO) or the School Land Board (SLB), to be used by the State for highway purposes.

The survey will be performed by a Texas Registered Professional Land Surveyor (RPLS), except in those circumstances in which the anticipated improvements may cause permanent shoreline alteration or other change or modification of a GLO property shoreline boundary. In such cases, a coastal boundary survey in the form and manner provided by Section 33.136, Texas Natural Resources Code, will be performed by a Texas Licensed State Land Surveyor (LSLS).

b. Tasks to be Completed by a LSLS

The State will request state land surveying on an as needed basis. The services will include, but are not limited to the following:

The Engineer's Surveyor shall:

- a. Survey the coastal and water boundaries, navigable streams or rivers, and other waters that are tidally affected, requiring the determination of the gradient boundary or the mean high water, as appropriate.
- b. Survey the profile of the waterway, along the proposed baseline of the highway.
- c. Survey original land grant boundaries and un-surveyed lands.
- d. Prepare field note descriptions, area calculations, parcel plats, and updating the current right-of-way maps, which are to be filed in the General Land Office.

3. Deliverables

The Engineer's Surveyor shall prepare all deliverables and present according to current right-of-way mapping standards.

4. Ground Control Accuracy Standards

The Engineer's Surveyor shall provide:

- a. Horizontal ground control in accordance with the current project datum.
- b. Vertical ground control in accordance with the current project datum.

B. Traffic Control

The Engineer's Surveyor shall control traffic in and near surveying operations adequately to comply with provisions of the latest edition of the Texas Manual on Uniform Traffic Control Devices – Part VI which can be found on the TxDOT internet site.

In the event field crew personnel must divert traffic or close traveled lanes, a Traffic Control Plan based upon principles outlined in the latest edition of the Texas Manual on Uniform Traffic Control Devices – Part VI shall be prepared by the Engineer's Surveyor and approved by the State prior to commencement of field work. A copy of the approved plan shall be in the possession of field crew personnel on the job site at all times and shall be made available to the State's personnel for inspection upon request.

C. Underground Excavation

The Engineer's Surveyor shall contact the "Texas Excavation Safety System, Inc." (DIGTESS), or call telephone number 811, to mark underground utilities prior to digging the holes for monuments, as necessary. The Engineer's Surveyor shall maintain documentation of all notification calls.

D. Preventative Measures to Prevent the Spread of Oak Wilt Contamination

Background: Oak Wilt is caused by the fungus *Ceratocystis fagacearum*. The first confirmed case of Oak Wilt was in Wisconsin in the early 1940s. It was not confirmed in Texas until 1960 and is now prevalent in many areas around the State. Although all oak species can contract Oak Wilt, Red or (Spanish) Oak and Live Oak are the two most susceptible. There is no cure for Oak Wilt, so prevention is the best defense.

The Engineer's Surveyor shall take the following preventive measures while cutting, pruning, or removing oak trees in counties which have confirmed cases of Oak Wilt, or at the direction of the State:

- i. When possible, employ alternative methods instead of pruning or cutting oak trees.
- ii. When possible, perform necessary pruning and cutting of healthy trees during the winter months of January and February when Sap Beetles are least active. Also, when possible, avoid pruning or cutting during Spring months when Sap Beetles are most active.

- iii. Treat wounds with pruning paint in Oak Wilt infected counties to discourage insects, especially during warm weather.
- iv. Sterilize all pruning tools between each tree with either Lysol™ spray or a 70 percent rubbing alcohol solution. The use of chlorine bleach solutions to sterilize pruning tools is discouraged due to premature oxidation or rusting of steel parts.
- v. Destroy the tree cuttings by burning or burying the wood, or dispose of the wood in an approved method.

E. Additional Requirements

1. Accuracy Requirements

All standards, procedures and equipment used by the Engineer's Surveyor shall be such that the results of the survey will be in compliance with Board Rule 663.15 as promulgated by the TBPLS.

2. Adherence to Schedule

If at any time during the contract period the Engineer's Surveyor determines that he will be unable to meet a scheduled submission date, he shall notify the State in writing immediately. This notification shall consist of an explanation as to the reason(s) for the delay and a revised submission schedule, which shall to the extent possible, incorporate a plan to recover days lost as a result of subject delay.

If at any time during the contract period the Engineer's Surveyor encounters unforeseen circumstances which may materially affect the scope, complexity or character of the work authorized by the State, the Engineer's Surveyor shall notify the State in writing immediately with a complete description of the circumstances encountered.

3. Transmittal

All documents submitted to the State shall be accompanied by a letter of transmittal which shall include, but need not be limited to, the highway number, project limits, county, CSJ, contract number, work authorization number and an inventory of attachments.

4. Right-of-Entry

It shall be the responsibility of the Engineer's Surveyor to secure permission to enter private property for purposes of survey. **It is the stated policy of the State to make every effort to maintain positive relations with the general public.** In pursuance of that policy, the Engineer's Surveyor shall not commit acts which will result in damages to private property and the Engineer's Surveyor will make every effort to comply with the wishes and address the concerns of private property owners.

F. **Compensation**

1. Payment requests shall include an Engineer's Surveyor's invoice.

2. Status Report

The Engineer's Surveyor shall submit a monthly progress report electronically by the 5th of each month following the month through which status is being reported. Progress and percent complete shall be according to the task as included in the scope.

With each payment request, the Engineer's Surveyor shall submit the corresponding project status report which will, as a minimum, include the percentage of total work complete as of the date of the payment request and a description of current work activity. The percentage of total work complete shall not be based simply on the percentage of funds expended, but shall be based on the best judgment of the Engineer's Surveyor as to the percentage of actual work complete.

Function Code 160 (163) – Utility Engineering Investigation (Subsurface Utility Engineering

Subsurface Utility Engineering (SUE) includes utility investigations subsurface and above ground prepared in accordance with AASHTO standards [ASCE C-1 38-02 (<http://www.fhwa.dot.gov/programadmin/asce.cfm>)] and Utility Quality Levels as follows.

A. **Utility Quality Levels** are defined in cumulative order (least to greatest) as follows:

1. Quality Level D - Existing Records: Utilities are plotted from review of available existing records.

2. Quality Level C - Surface Visible Feature Survey: Quality level "D" information from existing records is correlated with surveyed surface-visible features. Includes Quality Level D information. If there are variances in the designated work area of Level D, a new schematic or plan layout will be necessary to identify the limits of the proposed project and the limits of the work area required for the work authorization; including highway stations, limits within existing or proposed right of way, additional areas outside the proposed right of way, and distances or areas to be included along existing intersecting roadways.
3. Quality Level B - Designate: Two-dimensional horizontal mapping. This information is obtained through the application and interpretation of appropriate non-destructive surface geophysical methods. Utility indications are referenced to established survey control. Incorporates quality levels C and D information to produce Quality Level B. If there are variances in the designated work area of Level D, a new schematic or plan layout will be necessary to identify the limits of the proposed project and the limits of the work area required for the work authorization; including highway stations, limits within existing or proposed right of way, additional areas outside the proposed right of way, and distances or areas to be included along existing intersecting roadways.
4. Quality Level A - Locate (Test Hole): Three-dimensional mapping and other characterization data. This information is obtained through exposing utility facilities through test holes and measuring and recording (to appropriate survey control) utility/environment data. Incorporates quality levels B, C and D information to produce Quality Level A.

B. Designate (Quality Level B). Designate means to indicate the horizontal location of underground utilities by the application and interpretation of appropriate non-destructive surface geophysical techniques and reference to established survey control. Designate (Quality Level B) Services are inclusive of Quality levels C and D.

The Engineer shall:

1. As requested by the State compile "As Built" information from plans, plats and other location data as provided by the utility owners.

2. Coordinate with utility owner when utility owner's policy is to designate their own facilities at no cost for preliminary survey purposes. The Engineer shall examine utility owner's work to ensure accuracy and completeness.
3. Designate, record, and mark the horizontal location of the existing utility facilities and their service laterals to existing buildings using non-destructive surface geophysical techniques. No storm sewer facilities are to be designated unless authorized by the State. A non-water base paint, utilizing the APWA color code scheme, must be used on all surface markings of underground utilities.
4. Correlate utility owner records with designating data and resolve discrepancies using professional judgment. A color-coded composite utility facility plan with utility owner names, quality levels, line sizes and subsurface utility locate (test hole) locations, shall be prepared and delivered to the State. It is understood by both the Engineer and the State that the line sizes of designated utility facilities detailed on the deliverable are from the best available records and that an actual line size is normally determined from a test hole vacuum excavation. A note must be placed on the designate deliverable only that states "line sizes are from best available records". All above ground appurtenance locations must be included in the deliverable to the State. This information shall be provided in the latest version of Micro Station or Geopak used by the State. The electronic file will be delivered on CD or DVD, as required by the State. A hard copy is required and must be signed, sealed, and dated by the Engineer. When requested by the State, the designated utility information must be overlaid on the State's design plans.
5. Determine and inform the State of the approximate utility depths at critical locations as determined by the State. This depth indication is understood by both the Engineer and the State to be approximate only and is not intended to be used preparing the right of way and construction plans.
6. Provide a monthly summary of work completed and in process with adequate detail to verify compliance with agreed work schedule.
7. Close-out permits as required.
8. Clearly identify all utilities that were discovered from quality levels C and D investigation, but cannot be depicted in quality level B standards. These utilities must have a unique line style and symbology in the designate (Quality Level B) deliverable.
9. Comply with all applicable State policy and procedural manuals.

C. Subsurface Utility Locate (Test Hole) Service (Quality Level A), Locate means to obtain precise horizontal and vertical position, material type, condition, size and other data that may be obtainable about the utility facility and its surrounding environment through exposure by non-destructive excavation techniques that ensures the integrity of the utility facility. Subsurface Utility Locate (Test Hole) Services (Quality Level A) are inclusive of Quality Levels B, C, and D.

The Engineer shall:

1. Review requested test hole locations and advise the State in the development of an appropriate locate (test hole) work plan relative to the existing utility infrastructure and proposed highway design elements.

2. Coordinate with utility owner inspectors as may be required by law or utility owner policy.
3. Neatly cut and remove existing pavement material, such that the cut not to exceed 0.10 square meters (1.076 square feet) unless unusual circumstances exist.
4. Measure and record the following data on an appropriately formatted test hole data sheet that has been sealed and dated by the Engineer:
 - a. Elevation of top and bottom of utility tied to the datum of the furnished plan.
 - b. Identify a minimum of two benchmarks utilized. Elevations shall be within an accuracy of 15mm (.591 inches) of utilized benchmarks.
 - c. Elevation of existing grade over utility at test hole location.
 - d. Horizontal location referenced to project coordinate datum.
 - e. Outside diameter of pipe or width of duct banks and configuration of non-encased multi-conduit systems.
 - f. Utility facility material(s).
 - g. Utility facility condition.
 - h. Pavement thickness and type.
 - i. Coating/Wrapping information and condition.
 - j. Unusual circumstances or field conditions.
5. Excavate test holes in such a manner as to prevent any damage to wrappings, coatings, cathodic protection or other protective coverings and features. Water excavation can only be utilized with written approval from the appropriate State District Office.
6. Be responsible for any damage to the utility during the locating process. In the event of damage, the Engineer shall stop work, notify the appropriate utility facility owner, the State and appropriate regulatory agencies. The regulatory agencies include, but are not limited to the Railroad Commission of Texas and the Texas Commission on Environmental Quality. The Engineer shall not resume work until the utility facility owner has determined the corrective action to be taken. The Engineer shall be liable for all costs involved in the repair or replacement of the utility facility.
7. Back fill all excavations with appropriate material, compact backfill by mechanical means, and restore pavement and surface material. The Engineer shall be responsible

for the integrity of the backfill and surface restoration for a period of three years. Install a marker ribbon throughout the backfill.

8. Furnish and install a permanent above ground marker (as specified by the State, directly above center line of the utility facility.
9. Provide complete restoration of work site and landscape to equal or better condition than before excavation. If a work site and landscape is not appropriately restored, the Engineer shall return to correct the condition at no extra charge to the State.
10. Plot utility location position information to scale and provide a comprehensive utility plan sign and sealed by the responsible Engineer. This information shall be provided in the latest version of Micro Station or Geopak format used by the State. The electronic file will be delivered on CD or DVD. When requested by the State, the Locate information must be over laid on the State's design plans.
11. Return plans, profiles, and test hole data sheets to the State. If requested, conduct a review of the findings with the State.
12. Close-out permits as required.

ATTACHMENT D
D-1
WORK AUTHORIZATION NO. _____
CONTRACT FOR ENGINEERING SERVICES

THIS WORK AUTHORIZATION is made pursuant to the terms and conditions of Article 5 of Engineering Contract No. _____ (the Contract) entered into by and between the State of Texas, acting by and through the Texas Department of Transportation (the State), and _____ (the Engineer).

PART I. The Engineer will perform engineering services generally described as _____ in accordance with the project description attached hereto and made a part of this Work Authorization. The responsibilities of the State and the Engineer as well as the work schedule are further detailed in exhibits A, B and C which are attached hereto and made a part of the Work Authorization.

PART II. The maximum amount payable under this Work Authorization is \$ _____ and the method of payment is _____ as set forth in Attachment E of the Contract. This amount is based upon fees set forth in Attachment E, Fee Schedule, of the Contract and the Engineer's estimated Work Authorization costs included in Exhibit D, Fee Schedule, which is attached and made a part of this Work Authorization.

PART III. Payment to the Engineer for the services established under this Work Authorization shall be made in accordance with Articles 3 thru 5 of the contract, and Attachment A, Article 1.

PART IV. This Work Authorization shall become effective on the date of final acceptance of the parties hereto and shall terminate on _____, unless extended by a supplemental Work Authorization as provided in Attachment A, Article 1.

The maximum contract time is the time needed to complete all work authorizations that will be issued in the first two years of the contract. All work authorizations must be issued within the initial two-year period, starting from the contract execution date.

PART V. This Work Authorization does not waive the parties' responsibilities and obligations provided under the Contract.

IN WITNESS WHEREOF, this Work Authorization is executed in duplicate counterparts and hereby accepted and acknowledged below.

THE ENGINEER**THE STATE OF TEXAS**

(Signature)

(Printed Name)

(Title)

(Date)

(Signature)

(Printed Name)

(Title)

(Date)

LIST OF EXHIBITS

Exhibit A	Services to be provided by the State
Exhibit B	Services to be provided by the Engineer
Exhibit C	Work Schedule
Exhibit D	Fee Schedule/Budget
Exhibit H-2	Subprovider Monitoring System Commitment Agreement

ATTACHMENT D
D-2
SUPPLEMENTAL WORK AUTHORIZATION NO. ____
WORK AUTHORIZATION NO. ____
CONTRACT FOR ENGINEERING SERVICES

THIS SUPPLEMENTAL WORK AUTHORIZATION is made pursuant to the terms and conditions of Article 5 Contract No. _____ hereinafter identified as the "Contract," entered into by and between the State of Texas, acting by and through the Texas Department of Transportation (the State), and _____ (the Engineer).

The following terms and conditions of Work Authorization No. ____ are hereby amended as follows:

This Supplemental Work Authorization shall become effective on the date of final execution of the parties hereto. All other terms and conditions of Work Authorization No. ____ not hereby amended are to remain in full force and effect.

IN WITNESS WHEREOF, this Supplemental Work Authorization is executed in duplicate counterparts and hereby accepted and acknowledged below.

THE ENGINEER

THE STATE OF TEXAS

(Signature)

(Signature)

(Printed Name)

(Printed Name)

(Title)

(Title)

(Date)

(Date)

ATTACHMENT E**FEE SCHEDULE
(Final Cost Proposal)**

This attachment provides the basis of payment and fee schedule. **The basis of payment for this contract is indicated by an "X" in the applicable box.** The basis shall be supported by the Final Cost Proposal (FCP) shown below. If more than one basis of payment is used, each one must be supported by a separate FCP.

"X"	Basis	
<u> X </u>	Lump Sum	The lump sum shall be equal to the maximum amount payable. The lump sum includes all direct and indirect costs and fixed fee. The Engineer shall be paid pro rata based on the percentage of work completed. For payment the Engineer is not required to provide evidence of actual hours worked, travel, overhead rates or other evidence of cost.
<u> X </u>	Unit Cost	The unit cost(s) for each type of unit and number of units are shown in the FCP. The unit cost includes all direct and indirect costs and fixed fee. The Engineer shall be paid based on the type and number of units fully completed and the respective unit cost. For payment, the Engineer is not required to provide evidence of actual hours worked, travel, overhead rates or any other cost data. The FCP may include special items, such as equipment which are not included in the unit costs. Documentation of these special costs may be required. The maximum amount payable equals the total of all units times their respective unit cost plus any special direct items shown.
<u> X </u>	Specified Rate Basis	The specified rates for each type of labor are shown in the FCP below. The FCP may include special items, such as equipment which are not included in the specified rates. Payment shall be based on the actual hours worked multiplied by the specified rate for each type of labor plus other agreed to special direct cost items. The specified rate includes direct labor and indirect cost and fixed fee. The State may request documentation of reimbursable direct costs including hours worked. Documentation of special item costs may be required. The specified rate is not subject to audit.
<u> </u>	Cost Plus Fixed Fee	<p>Payment shall be based on direct and indirect costs incurred <u>plus</u> a pro rata share of the fixed fee based on the ratio of <u>labor and overhead cost incurred to total estimated labor and overhead cost in the FCP</u> or the percentage of work completed. The invoice must itemize labor rates, hours worked, other direct costs and indirect costs. The Engineer may be required to provide documentation of hours worked and any eligible direct costs claimed. The provisional overhead rate charged is subject to audit and adjustment to actual rates incurred. The FCP below shows the hourly rates for labor, other direct expenses including but not limited to travel and allowable materials, provisional overhead rate and the fixed fee.</p> <p>___A. Actual Cost Plus Fixed Fee - Actual wages are paid (no minimum, no maximum. This option does not apply to Indefinite Deliverable Contracts.)</p> <p>___B. Range of Cost Plus Fixed Fee – Actual wages <u>must</u> be within the allowable range shown on the Final Cost Proposal.</p>

ATTACHMENT E – FEE SCHEDULE

Final Cost Proposal (FCP) Supporting Basis of Payment

* The **MAXIMUM AMOUNT PAYABLE** is **\$2,000,000.00**.

The maximum amount payable is based on the following data and calculations:

* Maximum amount payable must be negotiated for each work authorization.

ATTACHMENT E - FEE SCHEDULE			
OTHER DIRECT EXPENSES			
Rates Shown Apply To Prime Provider and All Subproviders			
Services To Be Provided	Unit	Fixed Cost	Maximum Cost
Lodging/Hotel (Taxes/fees not included)	day/person		Current State Rate
Lodging/Hotel - Taxes and Fees	day/person		\$ 50.00
Meals (Excluding alcohol & tips) (Overnight stay required)	day/person		Current State Rate
Mileage	mile	Current State Rate	
Rental Car (Includes taxes and fees; Insurance costs will not be reimbursed)	day		\$ 50.00
SUV or ATV Rental (Includes taxes and fees; Insurance costs will not be reimbursed)	day		\$ 150.00
Rental Car Fuel	gallon		\$ 3.90
Air Travel (Use with Indefinite Deliverable Contracts)	Rd Trip/person		COACH FARE
Oversize, special handling or extra baggage airline fees (with advance coordination with TxDOT)	each		Current Airline Rate
Taxi/Cab fare	each/person		\$ 30.00
Parking	day		\$ 15.00
Toll Charges	each		\$ 4.00
Standard Postage	letter	Current Postal	
Certified Letter Return Receipt	each	Current Postal	
Overnight Mail - letter size	each		Current Postal
Overnight Mail - oversized box	each		\$ 30.00
Materials and Shipping	Per Package		\$ 25.00
Courier Services	each		\$ 25.00
Photocopies B/W (8 1/2" X 11")	each	\$ 0.10	
Photocopies B/W (11" X 17")	each	\$ 0.20	
Photocopies Color (8 1/2" X 11")	each	\$ 0.40	
Photocopies Color (11" X 17")	each	\$ 0.75	
Cardstock Color (8 1/2" X 11")	each	\$ 1.10	
Digital Ortho Plotting	sheet	\$ 1.35	
Plots (B/W on Bond)	square foot	\$ 0.75	
Plots (Color on Bond)	square foot	\$ 1.25	
Plots (Color on Photographic Paper)	square foot	\$ 4.00	
Color Graphics on Foam Board	square foot	\$ 5.00	
Presentation Boards 30" X 40" Color Mounted	each		\$ 66.00
Report Printing	each		\$ 50.00
Report Binding and Tabbing	each	\$ 4.50	
Notebooks	each		\$ 6.50
Reproduction of CD/DVD	each		\$ 4.00
CDs	each	\$ 1.50	
4" X 6" Digital Color Print	picture	\$ 0.30	
Tx Parks & Wildlife Data Request Fees	each		\$ 45.00
Hazardous Materials Database Search	per search		\$ 450.00
Noise Meter Rental	per project		\$ 150.00
Environmental Database Search	per project		\$ 500.00
Environmental Field Supplies (lathes, stakes, flagging, spray paint, etc.)	day		\$ 35.00
TARL Curation Fee	site		\$ 64.00
Curator (Drawer & TX Archaeological Research Lab for artifacts & report)	per project		\$ 1,450.00
Newspaper Advertisement	per publication		\$ 2,500.00
Court Reporter	page		\$ 8.00
Court Reporter (Public Meetings, Hearings & Transcription)	day		\$ 500.00
Translator (English to Spanish, other language as appropriate, or Sign Language) for Public Involvement	event		\$ 400.00
Translator (English to Spanish, other language as appropriate, or Sign Language)	hour		\$ 100.00
Written Translation Services	word	\$ 0.17	
Custodian for Public Involvement	hour/custodian		\$ 28.00
Sound Technician for Public Involvement	event		\$ 250.00
Public Involvement Facility Rental (estimate)	4 hours		\$ 750.00
Public involvement Facility Rental (estimate)	8 hours		\$ 3,000.00
Public Involvement Facility Rental (estimate)	hour		\$ 150.00
Public Involvement Facility Rental	event		\$ 800.00
Audio - Equipment Rental	each		\$ 300.00
Audio - Visual Equipment Rental	event		\$ 450.00
Public Involvement Graphic Artist	event	\$ 60.00	
Professional Narrator for Public Involvement	event	\$ 250.00	

ATTACHMENT E - FEE SCHEDULE			
OTHER DIRECT EXPENSES			
Rates Shown Apply To Prime Provider and All Subproviders			
Services To Be Provided	Unit	Fixed Cost	Maximum Cost
Professional Narrator for Public Involvement	hour	\$ 100.00	
Property Record Fees (Courthouse and Courthouse Direct Record Fees)	Per Parcel		\$ 24.00
Public Notices - Mass Mailing (500 pieces)	per mailing		\$ 500.00
Public Notices - Mass Mailing/with Self Addressed Return Envelope (500 pieces)	per mailing		\$ 700.00
Electronic Message Signs	day		\$ 150.00
Website set-up and maintenance	each		\$ 350.00
Website URL Rental	year	\$ 30.00	
LargeProject Wesite annual fees	each		\$ 500.00
Railroad - Flagger (Service provided by RR)	Hour		\$ 70.00
Railroad - Insurance in addition to STD Minimum Required (Minimum coverage of \$1 Million required by RR.)	each		\$ 1,750.00
Railroad - Permit	each		\$ 650.00
Railroad - Safety Training (If required - Heavy Rail Safety Training Certificate, includes classroom training and employee certification card.)	per person		\$ 200.00
Traffic Control Services, Arrow Boards and Attenuator trucks - Small Project (Includes labor, equipment and fuel)	day		\$ 1,200.00
Traffic Control Services, Arrow Boards and Attenuator trucks - Medium Project (Includes labor, equipment and fuel)	day		\$ 1,800.00
Traffic Control Services, Arrow Boards and Attenuator trucks - Large Project (Includes labor, equipment and fuel)	day		\$ 2,300.00
Attenuator trucks - (Lane/Shoulder Closure) (Includes labor, equipment and fuel)	day		\$ 450.00
Attenuator trucks - (No Lane Closure) (Includes labor, equipment and fuel)	day		\$ 300.00
Flashing Arrow Board	day		\$ 300.00
Portable Message Board	day		\$ 200.00
Law Enforcement/Uniform Officer (including vehicle)	hour		\$ 75.00
Required Permit Fees (non- railroad)	each		\$ 100.00
Boat with Motor	day		\$ 200.00
Bulldozer Rental	day		\$ 1,000.00
Backhoe Rental	day		\$ 1,000.00
Rental Equipment - Gasoline Powered Auger	day		\$ 80.00
Hazardous Materials Database Search	per search		\$ 450.00
FEMA FIS Backup Data Request	each		\$ 300.00
FEMA FIS (Manual)	each		\$ 5.00
GPS Receiver (rates applied to actual time GPS units are in use)	hour		\$ 30.00
GPS RTK (rates applied to actual time GPS units are in use)	hour	\$ 30.00	
GPS Static (rates applied to actual time GPS units are in use)	hour	\$ 30.00	
Map Records	sheet		\$ 3.75
Deed Copies	sheet	\$ 2.00	
Certified Deed Copies	sheet	\$ 2.50	
Historical Aerial Images	Unit		\$ 150.00
Aerial Photographs (1" = 500' scale)	each		\$ 90.00
Type II ROW Monument - Excavated/Drilled, rocks, rocky soil. 2-4 inch depth (Includes crew time, equipment, materials, rentals, & labor.) Brass Marker supplied by TxDOT.	each	\$ 70.00	
Type II ROW Monument - Poured 2-3 Feet (Includes One Call, crew time, equipment, materials, rentals, labor.) Brass Marker supplied by TxDOT.	each	\$ 200.00	
Reprographics	per sq ft	\$ 3.00	
Terrestrial Laser Scanner (rates applied to actual time scanner unit is in use)	hour	\$ 75.00	
Ground Target (includes paint, panel material, etc.)	each	\$ 15.00	
Helicopter Equipment LiDAR -Transit Miles (including turn, maneuver miles and local airport to project)	per mile	\$ 12.50	
Helicopter Equipment LiDAR -Project Flight Miles (On project flight miles)	per mile	\$ 52.00	
Fixed Wing Airborne LiDAR- Transit Miles (including turn, maneuver miles and local airport to project)	per mile	\$ 7.50	
Fixed Wing Airborne LiDAR- Project Flight Miles (On project flight miles)	per mile	\$ 20.00	

WAs Used

ATTACHMENT E - FEE SCHEDULE			
OTHER DIRECT EXPENSES			
Rates Shown Apply To Prime Provider and All Subproviders			
Services To Be Provided	Unit	Fixed Cost	Maximum Cost
Aerial Photography- Transit miles (including turn, maneuver miles and local airport to project)	per mile	\$ 5.90	
Aerial Photography- Project Flight Miles (On project flight miles)	per mile	\$ 25.00	
Aerial Photography- Airborne GPS/IMU Data collection/Processing	per project	\$ 2,275.00	
Photo Lab Service- Black and White Processing (film, development, scanning)	per frame	\$ 15.00	
Photo Lab Service- Color Processing (film, development, scanning)	per frame	\$ 25.00	
Photo Lab Service- Color Infrared Processing (film, development, scanning)	per frame	\$ 22.88	
Photo Lab Service- Digital image processing	Per Frame	\$ 17.00	
Photo Lab Service- Enlargements, Lamination, Mounting	per sq ft	\$ 5.00	
Datum Point Rods Monument (Includes equipment, materials, rentals)	each	\$ 135.00	
Fathometer	day	\$ 90.00	
24-Hour Automated Tube Counts - Volume	per counter/day	\$ 160.00	
24-Hour Automated Tube Counts - Bi-directional	per counter/day	\$ 160.00	
24-Hour Automated Tube Counts - Urban Freeway Main Lanes	per counter/day	\$ 350.00	
24-Hour Automated Tube Counts - Rural Main Lanes	per counter/day	\$ 200.00	
24-Hour Automated Tube Counts - Speed or Class	per counter/day	\$ 160.00	
24-Hour Volume Video Counts - Main Lanes	per camera/day	\$ 150.00	
24-Hour Classification Video Counts - Main Lanes	per camera/day	\$ 275.00	
Intersection Turning Movement Counts	per counter/hour/day	\$ 100.00	
Turning Movement Count (12-hour Manual) Minor Intersection	each	\$ 600.00	
Turning Movement Count (12-hour Manual) Major Intersection	each	\$ 1,200.00	
2-hour Turning Movement Count, Minor Intersection, Weekday	each	\$ 175.00	
2-hour Turning Movement Count, Major Intersection, Weekday	each	\$ 325.00	
2-hour Turning Movement Count, Minor Intersection, Weekend	each	\$ 200.00	
2-hour Turning Movement Count, Major Intersection, Weekend	each	\$ 350.00	
Travel Time Runs in DMI-Equipped Vehicle (Includes labor and mileage)	hour	\$ 55.00	
Speed Survey (location)	per location	\$ 170.00	
Intersection Diagrams / Sketches	per intersection	\$ 50.00	
Intersection Photography	per intersection	\$ 40.00	
Video Origin & Destination (capture)	per camera intersection/ location	\$ 350.00	
Personal Surveys O&D Interviews	per site (one-way)	\$ 125.00	
Profit not allowed on Other Direct Expenses.			
For Cost Plus Fixed Fee, Specified Rate, and Unit Cost - Unless fixed, actual rates to be billed not to exceed the maximum shown. Documentation such as receipts or usage logs for other direct expenses are necessary for reimbursement, except for meals. For Lump Sum - No documentation required. Invoicing by physical percent complete includes combination of direct labor and other direct expenses.			
NOTE: For Cost Plus Fixed Fee, Specified Rate, and Unit Cost - Miscellaneous other direct expenses up to \$100 per unit will be reimbursed at cost if approved and documented in advance by the State's Project Manager. Miscellaneous other direct expenses of \$100 per unit or more will not be reimbursed unless a supplemental agreement to the contract and work authorization (if WAs are used) has been executed in advance authorizing the miscellaneous other direct expenses. No more than \$2,500 in miscellaneous other direct expenses may be approved by the State's Project Manager over the life of this contract including prime provider and subproviders. For Lump Sum - This statement does not apply.			

ATTACHMENT E - FEE SCHEDULE			
SPECIFIED RATE AND LUMP SUM PAYMENT BASIS			
PRIME PROVIDER NAME:		Klotz Associates, Inc.	
Direct Labor			
Labor/Staff Classification	Years of Experience	Hourly Base Rate	Hourly Contract Rate
Principal	20+	\$ 71.00	\$ 218.68
Senior Project Manager	20+	\$ 71.00	\$ 218.68
Quality Manager	10 to 20	\$ 60.00	\$ 184.80
Senior Engineer	15+	\$ 58.00	\$ 178.64
Project Engineer	10 to 15	\$ 48.00	\$ 147.84
Design Engineer	5 to 10	\$ 42.00	\$ 129.36
Engineer-In-Training	1 to 5	\$ 32.50	\$ 100.10
Senior Engineer Tech	15+	\$ 36.00	\$ 110.88
Engineer Tech	5 to 15	\$ 31.00	\$ 95.48
Junior Engineer Tech	1 to 5	\$ 24.00	\$ 73.92
Senior CADD Operator	15+	\$ 29.00	\$ 89.32
CADD Operator	5 to 15	\$ 24.00	\$ 73.92
Junior CADD Operator	1 to 5	\$ 20.00	\$ 61.60
Senior Environmental Planner	15+	\$ 55.00	\$ 169.40
Environmental Planner IV	10 to 15	\$ 49.00	\$ 150.92
Environmental Planner III	5 to 10	\$ 40.00	\$ 123.20
Environmental Planner I/II	1 to 5	\$ 32.00	\$ 98.56
Senior Environmental Specialist	15+	\$ 42.00	\$ 129.36
Environmental Specialist	5 to 15	\$ 28.00	\$ 86.24
Junior Environmental Specialist	1 to 5	\$ 25.00	\$ 77.00
Senior Environmental Scientist	15+	\$ 48.00	\$ 147.84
Environmental Scientist IV	10 to 15	\$ 40.00	\$ 123.20
Environmental Scientist III	5 to 10	\$ 33.00	\$ 101.64
Environmental Scientist I/II	1 to 5	\$ 26.00	\$ 80.08
Senior Biologist	15+	\$ 44.00	\$ 135.52
Biologist IV	10 to 15	\$ 38.00	\$ 117.04
Biologist III	5 to 10	\$ 32.00	\$ 98.56
Biologist I/II	1 to 5	\$ 29.00	\$ 89.32
Admin/Clerical		\$ 20.00	\$ 61.60
Environmental Manager	25+	\$ 60.00	\$ 184.80
Senior Hydrologist	15+	\$ 55.00	\$ 169.40
Senior Structural Engineer	20+	\$ 64.00	\$ 197.12
		\$ -	\$ -
INDIRECT COST RATE:		180.00%	
PROFIT RATE:		10.0%	
Contract rates include labor, overhead, and profit.			
All rates are negotiated rates and are not subject to change or adjustment.			
Specified Rate Payment Basis - Contract rates to be billed. Documentation of hours must be maintained and is subject to audit.			
Lump Sum Payment Basis - Invoice by deliverable, according to the table of deliverables. Documentation of hours worked not required.			
Note: Any direct labor, unit cost, or other direct expense classification included in the contract, but not in a work authorization, is not eligible for payment under that work authorization.			

ATTACHMENT E - FEE SCHEDULE			
SPECIFIED RATE AND LUMP SUM PAYMENT BASIS			
SUBPROVIDER NAME:		Jacobs Engineering Group, Inc.	
Direct Labor			
Labor/Staff Classification	Years of Experience	Hourly Base Rate	Hourly Contract Rate
Senior Project Manager	20+	\$ 83.00	\$ 191.33
Quality Manager	10 to 20	\$ 62.00	\$ 142.92
Senior Engineer	15+	\$ 70.00	\$ 161.36
Project Engineer	10 to 15	\$ 52.00	\$ 119.87
Design Engineer	5 to 10	\$ 46.00	\$ 106.04
Senior Landscape Architect	15+	\$ 60.00	\$ 138.31
Landscape Architect	5 to 15	\$ 38.00	\$ 87.60
Engineer-In-Training	1 to 5	\$ 36.00	\$ 82.99
Senior Engineer Tech	15+	\$ 45.00	\$ 103.73
Engineer Tech	5 to 15	\$ 37.00	\$ 85.29
Senior CADD Operator	15+	\$ 38.00	\$ 87.60
CADD Operator	5 to 15	\$ 30.00	\$ 69.15
Senior Environmental Planner	15+	\$ 70.00	\$ 161.36
Environmental Planner IV	10 to 15	\$ 52.00	\$ 119.87
Environmental Planner III	5 to 10	\$ 45.00	\$ 103.73
Environmental Planner I/II	1 to 5	\$ 29.00	\$ 66.85
Senior Environmental Specialist	15+	\$ 52.00	\$ 119.87
Senior Environmental Scientist	15+	\$ 60.00	\$ 138.31
Senior Archeologist-Principal Investigator	15+	\$ 60.00	\$ 138.31
Archeologist IV	10 to 15	\$ 55.00	\$ 126.78
Senior Architectural Historian	15+	\$ 45.00	\$ 103.73
Senior Public Involvement Officer	15+	\$ 58.00	\$ 133.70
Public Involvement Officer	5 to 15	\$ 54.00	\$ 124.48
Transportation Planner IV	10 to 15	\$ 38.00	\$ 87.60
Senior Urban Planner	15+	\$ 58.00	\$ 133.70
Urban Planner III	5 to 10	\$ 33.50	\$ 77.22
Urban Planner I/II	1 to 5	\$ 30.00	\$ 69.15
Admin/Clerical		\$ 24.00	\$ 55.32
RPLS - Project Manager	15+	\$ 55.00	\$ 126.78
RPLS - Task Leader	10 to 15	\$ 52.00	\$ 119.87
Senior Survey Tech (Must be Surveyor in Training (SIT), or have a minimum of five year's surveying experience)	5 to 10	\$ 39.00	\$ 89.90
Survey Tech	1 to 5	\$ 32.00	\$ 73.77
GIS Operator		\$ 30.00	\$ 69.15
Aerial Mapping Technician		\$ 27.00	\$ 62.24
Traffic Engineer	5 to 10	\$ 58.00	\$ 133.70
Traffic Engineer - Modeller/Analyst	5 to 10	\$ 38.00	\$ 87.60
		\$ -	\$ -
INDIRECT COST RATE:		109.56%	
PROFIT RATE:		10.0%	
Contract rates include labor, overhead, and profit.			
All rates are negotiated rates and are not subject to change or adjustment.			
Specified Rate Payment Basis - Contract rates to be billed. Documentation of hours must be maintained and is subject to audit.			
Lump Sum Payment Basis - Invoice by deliverable, according to the table of deliverables. Documentation of hours worked not required.			
Note: Any direct labor, unit cost, or other direct expense classification included in the contract, but not in a work authorization, is not eligible for payment under that work authorization.			

ATTACHMENT E - FEE SCHEDULE			
SPECIFIED RATE AND LUMP SUM PAYMENT BASIS			
SUBPROVIDER NAME:		Cox McLain Environmental Consulting, Inc.	
Direct Labor			
Labor/Staff Classification	Years of Experience	Hourly Base Rate	Hourly Contract Rate
Project Manager	10 to 20	\$ 58.00	\$ 156.31
Quality Manager	10 to 20	\$ 56.00	\$ 150.92
Landscape Architect	5 to 15	\$ 34.00	\$ 91.63
Senior Environmental Planner	15+	\$ 52.00	\$ 140.14
Environmental Planner IV	10 to 15	\$ 44.00	\$ 118.58
Environmental Planner I/II	1 to 5	\$ 29.00	\$ 78.16
Senior Environmental Specialist	15+	\$ 42.00	\$ 113.19
Environmental Specialist	5 to 15	\$ 28.00	\$ 75.46
Junior Environmental Specialist	1 to 5	\$ 25.00	\$ 67.38
Senior Environmental Scientist	15+	\$ 48.00	\$ 129.36
Environmental Scientist IV	10 to 15	\$ 40.00	\$ 107.80
Environmental Scientist III	5 to 10	\$ 33.00	\$ 88.94
Environmental Scientist I/II	1 to 5	\$ 26.00	\$ 70.07
Senior Biologist	15+	\$ 37.00	\$ 99.72
Biologist III	5 to 10	\$ 28.00	\$ 75.46
Biologist I/II	1 to 5	\$ 26.00	\$ 70.07
Senior Archeologist-Principal Investigator	15+	\$ 37.50	\$ 101.06
Archeologist IV	10 to 15	\$ 44.00	\$ 118.58
Archeologist III	5 to 10	\$ 33.00	\$ 88.94
Archeologist I/II	1 to 5	\$ 25.00	\$ 67.38
Senior Field Tech (Envrionmental, Biological, Archeological)	15+	\$ 24.00	\$ 64.68
Field Tech (Envrionmental, Biological, Archeological)	5 to 15	\$ 19.00	\$ 51.21
Historian III	5 to 10	\$ 27.00	\$ 72.77
Historian I/II	1 to 5	\$ 25.00	\$ 67.38
Senior Architectural Historian	15+	\$ 36.00	\$ 97.02
Architectural Historian	5 to 15	\$ 33.00	\$ 88.94
Senior Public Involvement Specialist	15+	\$ 37.00	\$ 99.72
Public Involvement Specialist	5 to 15	\$ 32.00	\$ 86.24
Admin/Clerical		\$ 19.00	\$ 51.21
Senior GIS Operator		\$ 31.00	\$ 83.55
GIS Operator		\$ 25.00	\$ 67.38
GIS Technician		\$ 24.00	\$ 64.68
		\$ -	\$ -
INDIRECT COST RATE:		145.00%	
PROFIT RATE:		10.0%	
Contract rates include labor, overhead, and profit.			
All rates are negotiated rates and are not subject to change or adjustment.			
Specified Rate Payment Basis - Contract rates to be billed. Documentation of hours must be maintained and is subject to audit.			
Lump Sum Payment Basis - Invoice by deliverable, according to the table of deliverables. Documentation of hours worked not required.			
Note: Any direct labor, unit cost, or other direct expense classification included in the contract, but not in a work authorization, is not eligible for payment under that work authorization. .			

ATTACHMENT E - FEE SCHEDULE**SPECIFIED RATE AND LUMP SUM PAYMENT BASIS**

SUBPROVIDER NAME:

Arias & Associates, Inc.

Direct Labor

Labor/Staff Classification	Years of Experience	Hourly Base Rate	Hourly Contract Rate
Project Manager	10 to 20	\$ 58.00	\$ 170.14
Senior Engineer	15+	\$ 54.00	\$ 158.40
Engineer-In-Training	1 to 5	\$ 32.00	\$ 93.87
Senior Engineer Tech	15+	\$ 34.00	\$ 99.73
Engineer Tech	5 to 15	\$ 26.00	\$ 76.27
Junior Engineer Tech	1 to 5	\$ 20.00	\$ 58.67
Senior Geologist	15+	\$ 38.00	\$ 111.47
Admin/Clerical		\$ 20.00	\$ 58.67
		\$ -	\$ -
INDIRECT COST RATE:		166.67%	
PROFIT RATE:		10.0%	

Contract rates include labor, overhead, and profit.

All rates are negotiated rates and are not subject to change or adjustment.

Specified Rate Payment Basis - Contract rates to be billed. Documentation of hours must be maintained and is subject to audit.

Lump Sum Payment Basis - Invoice by deliverable, according to the table of deliverables. Documentation of hours worked not required.

Note: Any direct labor, unit cost, or other direct expense classification included in the contract, but not in a work authorization, is not eligible for payment under that work authorization.

ATTACHMENT E - FEE SCHEDULE**SPECIFIED RATE AND LUMP SUM PAYMENT BASIS**

SUBPROVIDER NAME: Gonzalez- De La Garza & Associates, Inc.

Direct Labor

Labor/Staff Classification	Years of Experience	Hourly Base Rate	Hourly Contract Rate
Project Manager	10 to 20	\$ 64.90	\$ 151.24
Admin/Clerical		\$ 19.00	\$ 44.28
RPLS - Project Manager	15+	\$ 45.00	\$ 104.87
RPLS - Task Leader	10 to 15	\$ 40.00	\$ 93.21
Senior Survey Tech (Must be Surveyor in Training (SIT), or have a minimum of five year's surveying experience)	5 to 10	\$ 29.00	\$ 67.58
Survey Tech	1 to 5	\$ 25.00	\$ 58.26
Senior GIS Operator		\$ 31.00	\$ 72.24
GIS Operator		\$ 25.00	\$ 58.26
GIS Technician		\$ 24.00	\$ 55.93
Project Coordinator - Mobile LiDAR		\$ 37.00	\$ 86.22
Mobile LiDAR Processing Technician		\$ 28.00	\$ 65.25
		\$ -	\$ -
INDIRECT COST RATE:		111.85%	
PROFIT RATE:		10.0%	

Contract rates include labor, overhead, and profit.

All rates are negotiated rates and are not subject to change or adjustment.

Specified Rate Payment Basis - Contract rates to be billed. Documentation of hours must be maintained and is subject to audit.**Lump Sum Payment Basis** - Invoice by deliverable, according to the table of deliverables. Documentation of hours worked not required.**Note:** Any direct labor, unit cost, or other direct expense classification included in the contract, but not in a work authorization, is not eligible for payment under that work authorization.

ATTACHMENT E - FEE SCHEDULE			
SPECIFIED RATE AND LUMP SUM PAYMENT BASIS			
SUBPROVIDER NAME:		Cobb Fendley & Associates, Inc.	
Direct Labor			
Labor/Staff Classification	Years of Experience	Hourly Base Rate	Hourly Contract Rate
Senior Project Manager	20+	\$ 67.00	\$ 196.41
Quality Manager	10 to 20	\$ 56.00	\$ 164.16
Senior Engineer	15+	\$ 54.00	\$ 158.30
Project Engineer	10 to 15	\$ 42.00	\$ 123.12
Design Engineer	5 to 10	\$ 40.00	\$ 117.26
Engineer-In-Training	1 to 5	\$ 29.00	\$ 85.01
Senior Engineer Tech	15+	\$ 34.00	\$ 99.67
Engineer Tech	5 to 15	\$ 28.00	\$ 82.08
Junior Engineer Tech	1 to 5	\$ 20.00	\$ 58.63
Senior CADD Operator	15+	\$ 28.00	\$ 82.08
CADD Operator	5 to 15	\$ 26.00	\$ 76.22
Junior CADD Operator	1 to 5	\$ 19.00	\$ 55.70
Admin/Clerical		\$ 22.00	\$ 64.49
RPLS - Project Manager	15+	\$ 45.00	\$ 131.92
Licensed State Land Surveyor	10+	\$ 48.00	\$ 140.71
RPLS - Task Leader	10 to 15	\$ 43.17	\$ 126.55
Senior Survey Tech (Must be Surveyor in Training (SIT), or have a minimum of five year's surveying experience)	5 to 10	\$ 30.70	\$ 90.00
Survey Tech	1 to 5	\$ 31.55	\$ 92.49
Senior GIS Operator		\$ 31.00	\$ 90.88
GIS Operator		\$ 25.00	\$ 73.29
GIS Technician		\$ 24.00	\$ 70.36
Project Coordinator - Mobile LiDAR		\$ 40.00	\$ 117.26
Mobile LiDAR Processing Technician		\$ 32.00	\$ 93.81
Project Coordinator - AM		\$ 43.17	\$ 126.55
Certified Photogrammetrist		\$ 38.19	\$ 111.95
Analytical Triangulation Specialist		\$ 27.23	\$ 79.82
Aerial Mapping Technician		\$ 25.24	\$ 73.99
Orthophoto Specialist		\$ 25.24	\$ 73.99
Mapping Editor (includes QA/QC, Finishing, & Finalization)		\$ 26.00	\$ 76.22
Aerial Office Technician		\$ 23.20	\$ 68.01
Project Coordinator - AP		\$ 41.51	\$ 121.69
Aerial Processing Technician		\$ 28.00	\$ 82.08
Project Coordinator - FWAL		\$ 41.51	\$ 121.69
Airborne LiDAR Processing Technician		\$ 30.00	\$ 87.95
Project Coordinator - HAL		\$ 41.51	\$ 121.69
Helicopter LiDAR Processing Technician		\$ 30.00	\$ 87.95
Photo Lab Specialist		\$ 17.50	\$ 51.30
Photo Processing Technician		\$ 21.50	\$ 63.03

ATTACHMENT E - FEE SCHEDULE			
SPECIFIED RATE AND LUMP SUM PAYMENT BASIS			
SUBPROVIDER NAME:		Cobb Fendley & Associates , Inc.	
Direct Labor			
Labor/Staff Classification	Years of Experience	Hourly Base Rate	Hourly Contract Rate
Abstractor (Property Deed Researcher, Courthouse or Internet research)		\$ 26.57	\$ 77.89
Senior Utilities Coordinator	15+	\$ 45.00	\$ 131.92
Utilities Coordinator		\$ 35.00	\$ 102.60
Senior Utilities Field Inspector		\$ 34.00	\$ 99.67
Utilities Field Inspector		\$ 30.00	\$ 87.95
Flagger		\$ 15.00	\$ 43.97
		\$ -	\$ -
INDIRECT COST RATE:		166.50%	
PROFIT RATE:		10.0%	
Contract rates include labor, overhead, and profit. All rates are negotiated rates and are not subject to change or adjustment. Specified Rate Payment Basis - Contract rates to be billed. Documentation of hours must be maintained and is subject to audit. Lump Sum Payment Basis - Invoice by deliverable, according to the table of deliverables. Documentation of hours worked not required. Note: Any direct labor, unit cost, or other direct expense classification included in the contract, but not in a work authorization, is not eligible for payment under that work authorization.			

ATTACHMENT E - FEE SCHEDULE**SPECIFIED RATE AND LUMP SUM PAYMENT BASIS**

SUBPROVIDER NAME: Concept Development & Planning, LLC

Direct Labor

Labor/Staff Classification	Years of Experience	Hourly Base Rate	Hourly Contract Rate
Project Manager	10 to 20	\$ 58.00	\$ 156.31
Senior Public Involvement Officer	15+	\$ 43.00	\$ 115.89
Public Involvement Officer	5 to 15	\$ 39.00	\$ 105.11
Senior Public Involvement Specialist	15+	\$ 37.00	\$ 99.72
Public Involvement Specialist	5 to 15	\$ 32.00	\$ 86.24
Junior Public Involvement Specialist	1 to 5	\$ 23.00	\$ 61.99
Admin/Clerical		\$ 19.00	\$ 51.21
		\$ -	\$ -
INDIRECT COST RATE:		145.00%	
PROFIT RATE:		10.0%	

Contract rates include labor, overhead, and profit.

All rates are negotiated rates and are not subject to change or adjustment.

Specified Rate Payment Basis - Contract rates to be billed. Documentation of hours must be maintained and is subject to audit.

Lump Sum Payment Basis - Invoice by deliverable, according to the table of deliverables. Documentation of hours worked not required.

Note: Any direct labor, unit cost, or other direct expense classification included in the contract, but not in a work authorization, is not eligible for payment under that work authorization.

ATTACHMENT E - FEE SCHEDULE**SPECIFIED RATE AND LUMP SUM PAYMENT BASIS**

SUBPROVIDER NAME:

Gram Traffic Counting, Inc.

Direct Labor

Labor/Staff Classification	Years of Experience	Hourly Base Rate	Hourly Contract Rate
Project Manager	10 to 20	\$ 60.00	\$ 161.70
Quality Manager	10 to 20	\$ 60.00	\$ 161.70
Admin/Clerical		\$ 23.00	\$ 61.99
		\$ -	\$ -
INDIRECT COST RATE:		145.00%	
PROFIT RATE:		10.0%	

Contract rates include labor, overhead, and profit.

All rates are negotiated rates and are not subject to change or adjustment.

Specified Rate Payment Basis - Contract rates to be billed. Documentation of hours must be maintained and is subject to audit.

Lump Sum Payment Basis - Invoice by deliverable, according to the table of deliverables. Documentation of hours worked not required.

Note: Any direct labor, unit cost, or other direct expense classification included in the contract, but not in a work authorization, is not eligible for payment under that work authorization.

ATTACHMENT E - FEE SCHEDULE**UNIT COST PAYMENT BASIS**

SUBPROVIDER NAME:

Gonzalez-De La Garza & Associates, Inc.

SERVICES TO BE PROVIDED	UNIT	COST
1 - Person Survey Crew (GPS and Robotic Total Stations included in indirect cost rate. Mileage not included.)	hour	\$ 70.00
2 - Person Survey Crew (GPS and Robotic Total Stations included in indirect cost rate. Mileage not included.)	hour	\$ 110.00
3 - Person Survey Crew (GPS and Robotic Total Stations included in indirect cost rate. Mileage not included.)	hour	\$ 140.00
4 - Person Survey Crew (GPS and Robotic Total Stations included in indirect cost rate. Mileage not included.)	hour	\$ 170.00
LiDAR Mobile Mapping System, (Includes Vehicle Operator, LiDAR Technician mileage on project and fuel) (Does not include travel to project.)	day	\$ 4,000.00

The unit costs shown include labor, overhead, and profit. Payment based on units completed. No partial payments.

All unit costs are negotiated costs and are not subject to change or adjustment.

Unit Cost Payment Basis: If unit costs by year are included, unit costs billed should correspond to the fiscal or calendar year, if applicable, in which the work was done.

Note: Any direct labor, unit cost, or other direct expense classification included in the contract, but not in a work authorization, is not eligible for payment under that work authorization.

ATTACHMENT E - FEE SCHEDULE		
UNIT COST PAYMENT BASIS		
SUBPROVIDER NAME: Cobb Fendley & Associates, Inc.		
SERVICES TO BE PROVIDED	UNIT	COST
1 - Person Survey Crew (GPS and Robotic Total Stations included in indirect cost rate. Mileage not included.)	hour	\$ 93.00
2 - Person Survey Crew (GPS and Robotic Total Stations included in indirect cost rate. Mileage not included.)	hour	\$ 131.00
3 - Person Survey Crew (GPS and Robotic Total Stations included in indirect cost rate. Mileage not included.)	hour	\$ 160.00
4 - Person Survey Crew (GPS and Robotic Total Stations included in indirect cost rate. Mileage not included.)	hour	\$ 190.00
LiDAR Mobile Mapping System, (Includes Vehicle Operator, LiDAR Technician mileage on project and fuel) (Does not include travel to project.)	day	\$ 4,000.00
Mobilization for Aerial Photography/LiDAR Fixed Wing Aircraft (Includes aircraft, Pilot, Camera/LiDAR Operator, fuel and transportation cost)	Project	\$ 17,000.00
Aerial Photography Flight Crew Fixed Wing Aircraft (Includes Pilot and Camera Operator)	hour	\$ 175.00
LiDAR Flight Crew Fixed Wing Aircraft (Includes Pilot and LiDAR Operator)	hour	\$ 180.00
Mobilization for Helicopter Airborne LiDAR (Includes helicopter, Pilot, LiDAR Operator, fuel and transportation cost)	mile	\$ 17,000.00
Helicopter Flight Crew Fixed Wing Aircraft (Includes Pilot and LiDAR Operator)	hour	\$ 193.75
<p>The unit costs shown include labor, overhead, and profit. Payment based on units completed. No partial payments.</p> <p>All unit costs are negotiated costs and are not subject to change or adjustment.</p> <p>Unit Cost Payment Basis: If unit costs by year are included, unit costs billed should correspond to the fiscal or calendar year, if applicable, in which the work was done.</p> <p>Note: Any direct labor, unit cost, or other direct expense classification included in the contract, but not in a work authorization, is not eligible for payment under that work authorization.</p>		

ATTACHMENT E - FEE SCHEDULE		
UNIT COST PAYMENT BASIS		
SUBPROVIDER NAME: Cobb Fendley & Associates, Inc.		
SERVICES TO BE PROVIDED	UNIT	COST
<u>SUE (Quality Level C and D)</u> Includes labor and equipment for records research, CADD, and mapping.	LF	\$ 0.40
<u>SUE (Quality Level B - Utility Designation)</u> Includes labor and equipment for records research, designating, engineering, surveying, CADD mapping and limited traffic control.	LF	\$ 1.45
<u>SUE (Quality Level A - Utility Locate, Test Holes)</u> Includes labor and equipment for vacuum excavation, engineering, surveying, CADD, and limited traffic control. These prices reflect that a Quality Level B service has been provided.		
Level A: 0 to 5 ft.	each	\$ 1,050.00
Level A: > 5 to 8 ft.	each	\$ 1,250.00
Level A: > 8 to 13 ft.	each	\$ 1,550.00
Level A: > 13 to 20 ft.	each	\$ 2,100.00
Level A: > 20 ft.	VF	\$ 100.00
<u>SUE Mobilization/Demobilization</u> These costs are intended to be a one-time expense compensation for mobilizing/demobilizing personnel and equipment portal to portal. Vacuum excavation truck (non-local)	Mile	\$ 4.00

Note: When the above unit prices are not utilized, the following appropriate rates will apply

SERVICES TO BE PROVIDED	UNIT	COST
<u>Subsurface Utility Engineering (SUE) Field Services</u>		
Interior pipe wall condition video (equipment only)(for small pipe from 12" to 24" in diameter)	day	\$ 200.00
Interior pipe wall condition video (equipment only)(for pipe larger than 24" in diameter)	hour	\$ 300.00
Ground Penetrating Radar (GPR) (equipment only)	hour	\$ 65.00
One (1) Designating Person with equipment	hour	\$ 100.00
Two (2) Designating Person with equipment	hour	\$ 140.00

The unit costs shown include labor, overhead, and profit. Payment based on units completed. No partial payments.

All unit costs are negotiated costs and are not subject to change or adjustment.

Unit Cost Payment Basis: If unit costs by year are included, unit costs billed should correspond to the fiscal or calendar year, if applicable, in which the work was done.

Note: Any direct labor, unit cost, or other direct expense classification included in the contract, but not in a work authorization, is not eligible for payment under that work authorization.

ATTACHMENT E - FEE SCHEDULE			
UNIT COST PAYMENT BASIS			
SUBPROVIDER NAME:		Arias & Associates, Inc.	
SERVICES TO BE PROVIDED	TEST CODE	UNIT	COST
Soils Tests			
Standard Test Method for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils	ASTM D2974	each	\$ 50.00
Determining Moisture Content in Soil Materials	Tex-103-E	each	\$ 11.00
Determining Liquid Limits of Soils	Tex-104-E	each	\$ 35.00
Determining Plastic Limit of Soils	Tex-105-E	each	\$ 35.00
Calculating the Plasticity Index of Soils	Tex-106-E	each	\$ 5.00
Determining the Bar Linear Shrinkage of Soils	Tex-107-E	each	\$ 35.00
Determining the Specific Gravity of Soils	Tex-108-E	each	\$ 45.00
Particle Size Analysis of Soils	Tex-110-E	each	\$ 70.00
Determining the Amount of Material in Soils Finer than the 75 micrometer (No. 200) Sieve	Tex-111-E	each	\$ 36.00
Laboratory Compaction Characteristics and Moisture-Density Relationship of Base Materials	Tex-113-E	each	\$ 200.00
Laboratory Compaction Characteristics and Moisture-Density Relationship of Subgrade, Embankment Soils, and Backfill Material	Tex-114-E	each	\$ 175.00
Field Method for Determining In-Place Density of Soils and Base Materials	Tex-115-E	each	\$ 42.00
Ball Mill Method for Determining the Disintegration of Flexible Base Material	Tex-116-E	each	\$ 175.00
Triaxial Compression Test for Disturbed Soils and Base Materials	Tex-117-E	each	\$ 1,450.00
Soil-Cement Testing	Tex-120-E	each	\$ 325.00
Soil-Lime Testing	Tex-121-E	each	\$ 325.00
Determining Soil pH	Tex-128-E	each	\$ 34.00
Measuring the Resistivity of Soil Materials	Tex-129-E	each	\$ 75.00
Slurry Testing	Tex-130-E	each	\$ 40.00
Texas Cone Penetration	Tex-132-E	each	\$ 30.00
Measuring Thickness of Pavement Layer	Tex-140-E	each	\$ 23.00
Determining Sulfate Content in Soils - Colorimetric Method	Tex-145-E	each	\$ 60.00
Unconfined Compressive Test of Cohesive Soil	ASTM D2166	each	\$ 55.00
One-Dimensional Consolidation	ASTM D2435	each	\$ 350.00
Soil Direct Shear (CD) Clay	ASTM D3080	each	\$ 650.00
Swell tests (Free Swell)	ASTM D4546	each	\$ 125.00
Swell tests (Pressure Swell)	ASTM D4646	each	\$ 135.00
Bituminous Tests			
Sieve Analysis for Fine and Coarse Aggregate	Tex-200-F	each	\$ 60.00
Bulk Specific Gravity and Water Absorption of Aggregate	Tex-201-F	each	\$ 65.00
Apparent Specific Gravity of Material Finer than No. 50 Sieve	Tex-202-F	each	\$ 50.00
Sand Equivalent	Tex-203-F	each	\$ 80.00
Design of Bituminous Mixtures	Tex-204-F	each	\$ 1,400.00
Laboratory Method of Mixing Bituminous Mixtures	Tex-205-F	set of 3	\$ 100.00
Compacting Specimens Using the Texas Gyrotray Compactor (TGC)	Tex-206-F	set of 3	\$ 75.00
Determining Density of Compacted Bituminous Mixtures	Tex-207-F (Part I)	each	\$ 30.00
Test of Stabilometer Value of Bituminous Mixtures	Tex-208-F	set of 3	\$ 100.00
Determining Asphalt Content of Bituminous by Extraction	Tex-210-F	each	\$ 165.00
Determining Deleterious Material and Decantation Test for Coarse Aggregates	Tex-217-F	each	\$ 75.00
Theoretical Maximum Specific Gravity of Bituminous Mixtures	Tex-227-F	each	\$ 75.00
Determining Asphalt Content from Asphalt Paving Mixtures by the Ignition Method	Tex-236-F	each	\$ 150.00
Superpave Gyrotray Compacting of Test Specimens of Bituminous Mixtures	Tex-241-F	set of 2	\$ 100.00
Determining Flat and Elongated Particles	Tex-280-F	each	\$ 90.00
Concrete & Aggregate Tests			
Sieve Analysis of Fine and Coarse Aggregate	Tex-401-A	each	\$ 52.00
Fineness Modulus of Fine Aggregate	Tex-402-A	each	\$ 65.00
Saturated Surface-Dry Specific Gravity and Absorption of Aggregates	Tex-403-A	each	\$ 45.00
Determining Unit Mass (Weight) of Aggregates	Tex-404-A	each	\$ 45.00
Determining Percent Voids and Solids in Concrete	Tex-405-A	each	\$ 25.00
Material Finer than 75 micrometer (No. 200) Sieve in Mineral Aggregates (Decantation Test for Concrete Aggregates)	Tex-406-A	each	\$ 55.00
Organic Impurities in Fine Aggregate for Concrete	Tex-408-A	each	\$ 60.00
Free Moisture and Water Absorption in Aggregate for Concrete	Tex-409-A	each	\$ 40.00
Abrasion of Coarse Aggregate Using the Los Angeles Machine	Tex-410-A	each	\$ 210.00
Soundness of Aggregate Using Sodium Sulfate or Magnesium Sulfate	Tex-411-A	each	\$ 125.00
Determining Deleterious Material in Mineral Aggregate	Tex-413-A	each	\$ 75.00
Air Content of Freshly Mixed Concrete by the Volumetric Method	Tex-414-A	each	\$ 30.00
Slump of Hydraulic Cement Concrete	Tex-415-A	each	\$ 30.00
Air Content of Freshly Mixed Concrete by the Pressure Method	Tex-416-A	each	\$ 32.00
Unit Weight, Yield, and Air Content (Gravimetric) of Concrete	Tex-417-A	each	\$ 32.00
Compressive Strength of Cylindrical Concrete Specimens	Tex-418-A	each	\$ 18.00
Compressive Strength of Concrete Using Portions of Beams Broken in Flexure	Tex-419-A	each	\$ 55.00

ATTACHMENT E - FEE SCHEDULE			
UNIT COST PAYMENT BASIS			
SUBPROVIDER NAME:		Arias & Associates, Inc.	
SERVICES TO BE PROVIDED	TEST CODE	UNIT	COST
Splitting Tensile Strength of Cylindrical Concrete Specimens	Tex-421-A	each	\$ 45.00
Measuring Temperature of Freshly Mixed Portland Cement Concrete	Tex-422-A	hour	\$ 16.00
Determining Pavement Thickness by Direct Measurement	Tex-423-A	each	\$ 25.00
Obtaining and Testing Drilled Cores of Concrete	Tex-424-A	each	\$ 300.00
Determining Compressive Strength of Grouts	Tex-442-A	each	\$ 23.00
Making and Curing Concrete Test Specimens	Tex-447-A	each	\$ 40.00
Flexural Strength of Concrete Using Simple Beam Third-Point Loading	Tex-448-A	each	\$ 32.00
Capping Cylindrical Concrete Specimens	Tex-450-A	each	\$ 8.00
Determining Crushed Face Particle Count	Tex-460-A	each	\$ 60.00
The unit costs shown include labor, overhead, and profit. Payment based on units completed. No partial payments.			
All unit costs are negotiated costs and are not subject to change or adjustment.			
Unit Cost Payment Basis: If unit costs by year are included, unit costs billed should correspond to the fiscal or calendar year, if applicable, in which the work was done.			
Note: Any direct labor, unit cost, or other direct expense classification included in the contract, but not in a work authorization, is not eligible for payment under that work authorization.			

ATTACHMENT E - FEE SCHEDULE			
UNIT COST PAYMENT BASIS			
SUBPROVIDER NAME:		Arias & Associates	
SERVICES TO BE PROVIDED	TEST	UNIT	COST
Geotechnical Engineering Services			
Volumetric Shrinkage	ASTM D427	each	\$ 55.00
Standard Proctor Test	ASTM D698	each	\$ 175.00
Modified Proctor Test	ASTM D1557	each	\$ 195.00
Standard Penetration Test (SPT)	ASTM D1586	LF	\$ 25.00
California Bearing Ratio (Single Sample without MD Curve)	ASTM D1883	test	\$ 300.00
Unconfined Compressive Strength (Soil)	ASTM D2166	each	\$ 60.00
Hydraulic Conductivity Permeability	ASTM D2434	each	\$ 210.00
One Dimensional Consolidation Properties of Soil	ASTM D2435	each	\$ 350.00
Unconfined Compressive Strength (Rock)	ASTM D2938	each	\$ 65.00
Direct Shear Test of Soils Under Consolidated Drained Conditions	ASTM D3080	set of 3	\$ 425.00
Splitting Tensile of Intact Rock Core	ASTM D3967	each	\$ 70.00
Water Stand Pipes	ASTM D4043	LF	\$ 25.00
Calcium Carbonate Content of Soils	ASTM D4373	each	\$ 45.00
Hydraulic Conductivity Permeability	ASTM D4511	each	\$ 125.00
One Dimensional Swell, Methods A & B	ASTM D4546	each	\$ 90.00
One Dimensional Swell, Method C	ASTM D4546	each	\$ 145.00
Permeability of Silt and Clays	ASTM D5084	each	\$ 275.00
Suction Test (Filter Method)	ASTM D5298	each	\$ 68.00
Soil Boring with SPT	ASTM D1586	LF	\$ 20.00
Soil Boring/Rock Coring with TCP (< 60 ft.)	Tex-132-E	LF	\$ 28.00
Soil Boring/Rock Coring with TCP (> 60 ft.)	Tex-132-E	LF	\$ 30.00
Soil Boring/Rock Coring without TCP (< 60 ft.)		LF	\$ 25.00
Soil Boring/Rock Coring without TCP (> 60 ft.)		LF	\$ 28.00
Soil Boring without TCP (< 60 ft.):			
(a) Utilizing Continuous Sampler	ASTM D1587	LF	\$ 25.00
(b) Shelby Push Tubes Extruded in Field	ASTM D1587	LF	\$ 25.00
(c) Augering	N/A	LF	\$ 15.00
Soil Boring without TCP (> 60 ft.):			
(a) Utilizing Continuous Sampler	ASTM D1587	LF	\$ 27.00
(b) Shelby Push Tubes Extruded in Field	ASTM D1587	LF	\$ 26.00
Core/drill operator/technician and coring equipment used to drill flexible and rigid pavement (2-man crew)			
(a) 4-in. diameter cores		Inch	\$ 8.50
(b) 6-in. diameter cores		Inch	\$ 11.00
Mobilization of Drilling Rig (Trips less than 100 miles from office to site)		each	\$ 350.00
Mobilization of Drilling Rig (Trips over 100 miles from office to site)		mile	\$ 3.00
Concrete/Asphalt Concrete Patch		each	\$ 50.00
Non-Destructive Deflection Testing Dynaflect		day	\$ 2,000.00
Non-Destructive Deflection Testing Falling Weight Deflection (FWD)		day	\$ 2,300.00
Non-Destructive Deflection Testing Heavy Weight Deflection (HWD)		day	\$ 2,750.00
The unit costs shown include labor, overhead, and profit. Payment based on units completed. No partial payments.			
All unit costs are negotiated costs and are not subject to change or adjustment.			
Unit Cost Payment Basis: If unit costs by year are included, unit costs billed should correspond to the fiscal or calendar year, if applicable, in which the work was done.			
Note: Any direct labor, unit cost, or other direct expense classification included in the contract, but not in a work authorization, is not eligible for payment under that work authorization.			

ATTACHMENT F

Not Applicable

ATTACHMENT G

Computer Graphics Files for Document and Information Exchange

Not Applicable

ATTACHMENT H-SG**Historically Underutilized Business
for State Funded Professional or Technical Services Contracts
HUB Goal Assigned-State of Texas Subcontracting Plan Required**

- 1) **POLICY.** It is the policy of the Department to ensure that HUBs shall have an equal opportunity to participate in the performance of contracts; to create a level playing field on which HUBs can compete fairly for contracts and subcontracts; to ensure nondiscrimination on the basis of race, color, national origin, or gender in the award and administration of contracts; to help remove barriers to the participation of HUBs in department contracts; and, to assist in the development of firms that can compete successfully in the market place outside the HUB program. Consequently, the HUB requirements of the Department's HUB Program apply to this contract as follows:
 - (1) The Provider agrees to insure that they shall take all necessary and reasonable steps to meet the HUB goal for this contract.
 - a. The Provider and any subprovider(s) shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of contracts.
 - b. When submitting the contract for execution by the Department, the Provider must complete and furnish Exhibit H-1 which lists the commitments made to all subproviders, including certified HUB subprovider(s) that are to meet the contract goal, and Exhibit H-2 which is a commitment agreement(s) containing the original signatures of the Provider and HUB(s) that were indicated in the original submitted State of Texas HUB Subcontracting Plan (HSP) in Section 8. For Work Authorization Contracts, Exhibit H-1 is required at the time of submitting the contract for execution by the Department. Exhibit H-2 will be required to be completed and attach with each work authorization number that is submitted for execution, if the HUB will be performing work. If non-HUB subprovider is performing work, insert N/A (not applicable) on the line provided. A prime must allow a HUB maximum opportunity to perform the work by not creating unnecessary barriers or artificial requirements for the purpose of hindering a HUB's performance under the contract. Any substitutions or changes to the HSP, in addition to any changes to the original contract award, shall be subject to prior written approval by the Department. If there are any changes to the subproviders during the contract term, the Provider must furnish a Revised Exhibit H-1 showing the revised commitment of all subproviders.
 - c. Failure to carry out the requirements set forth above shall constitute a breach of contract and may result in a letter of reprimand; in termination of the contract by the Department; in a deduction from money due or to become due to the Provider, not as a penalty but as damages to the Department's HUB Program; or such other remedy or remedies as the Department deems appropriate.
- 2) **DEFINITIONS.**
 - a. "Department" means the Texas Department of Transportation (TxDOT).
 - b. "Contract" is the agreement between the Texas Department of Transportation and a Provider.
 - c. "Provider" is any individual or company that provides professional or technical services.
 - d. "Joint Venture" means an association of two or more businesses to carry out a single business enterprise for profit which combines their property, capital, efforts, skills and knowledge.
 - e. "Historically Underutilized Business (HUB)" means any business so certified by the Texas Building and Procurement Commission.
- 3) **PERCENTAGE GOAL.** The goal for Historically Underutilized Business (HUB) participation in the work to be performed under this contract is 23.7 % of the contract amount.
- 4) **PROVIDER'S RESPONSIBILITIES.** A Provider (HUB or non-HUB) must perform a minimum of 30% of the contract with its employees (as defined by the Internal Revenue Service). The contract is subject to the HSP Good Faith Effort Requirements.
 - a. A Provider who cannot meet the contract goal, in whole or in part, should have documented any of the following and other efforts made as a "Good Faith Effort" to obtain HUB participation.
 - (1) Whether the prime advertised in general circulation, trade association, and/or minority/women focus media concerning subcontracting opportunities.

- (2) Whether the prime provided written notice to at least three (3) qualified HUBs allowing sufficient time for HUBs to participate effectively.
- (3) Whether the prime documented reasons for rejection or met with the rejected HUB to discuss the rejection.
- (4) Whether the prime provided qualified HUBs with adequate information about bonding, insurance, the plans, the specifications, scope of work and requirements of the contract.
- (5) Whether the prime negotiated in good faith with qualified HUBs, not rejecting qualified HUBs who are also the lowest responsive bidder.
- (6) Whether the prime used the services of available minority and women community organizations, contractor's groups, local, state, and federal business assistance offices, and other organizations that provide support services to HUBs.

NOTE: The Provider must not cause or allow subproviders to bid their services.

- b. The preceding information shall be submitted directly to the Chair of the Consultant Selection Team responsible for the contract.
 - c. The Provider shall make all reasonable efforts to honor commitments to HUB subproviders named in the original HSP in Section 8. Where the Provider terminates or removes a HUB subprovider named in the initial commitment, the Provider must demonstrate on a case-by-case basis to the satisfaction of the Department that the originally designated HUB was not able or willing to perform. The term "unable" includes, but is not limited to, a firm that does not have the resources and expertise to finish the work and/or a firm that substantially increases the time to complete the project.
 - d. The Provider shall make all reasonable efforts to replace a HUB subprovider that is unable or unwilling to perform successfully with another HUB and must meet the HSP Good Faith Effort Requirements. Any substitution of HUBs shall be subject to prior written approval by the Department. The Department will request a statement from the firm being replaced concerning its replacement prior to approving the substitution. If there are any changes to the subproviders during the contract term, the Provider must furnish a Revised Exhibit H-1 showing the revised commitment of all subproviders.
 - e. The Provider shall designate a HUB liaison officer who will administer the Provider's HUB program and who will be responsible for maintenance of records of efforts and contacts made to subcontract with HUBs.
- 5) **ELIGIBILITY OF HUBs.**
- a. The Texas Building and Procurement Commission (TBPC) certifies the eligibility of HUBs.
 - b. The TBPC maintains a directory of certified HUBs. The HUB Directory is available through the Department's Business Opportunity Programs Office and through the Internet at the TBPC's Website (<http://www2.tbpc.state.tx.us/cmb1/hubonly.html>).
 - c. Only HUB firms certified and identified in specific categories and classes at the time the contract is signed or at the time the commitments are submitted are eligible to be used in the information furnished by the Provider as required under Section 2.c. above.
 - d. If during the course of the contract it becomes necessary to substitute another HUB firm for a firm named in the information submitted by the Provider as required by Section 2.c. above, then only certified HUBs will be considered eligible as a substituted firm. The Provider's written request for substitutions of HUB subproviders shall be accompanied by a detailed explanation, which should substantiate the need for a substitution. The Department will verify the explanation with the HUB firm being replaced before giving approval of the substitution. If there are any changes to the subproviders during the contract term, the Provider must furnish a Revised Exhibit H-1 showing the revised commitment of all subproviders.
 - e. The 73rd Legislature passed Texas Civil Statutes, Article 601i, relative to contracts between governmental entities and certain disadvantaged businesses. The Statute provides for civil penalties for persons who falsely claim disadvantaged business status and for the general contractor who knowingly contracts with a person claiming to be a disadvantaged business.

6) **DETERMINATION OF HUB PARTICIPATION.**

A firm must be an eligible HUB and perform a professional or technical function relating to the project. Proof of payment, such as copies of canceled checks, properly identifying the Department's contract number or project number may be required to substantiate the payment, as deemed necessary by the Department. A HUB subprovider, with prior written approval from the Department, may subcontract 70% of a contract as long as the HUB subprovider performs a commercially useful function. All subcontracts shall include the provisions

required in the subcontract and shall be approved as to form, in writing, by the Department prior to work being performed under the subcontract. A HUB performs a commercially useful function when it is responsible for a distinct element of the work of a contract; and actually manages, supervises, and controls the materials, equipment, employees, and all other business obligations attendant to the satisfactory completion of contracted work. If the subcontractor uses an employee leasing firm for the purpose of providing salary and benefit administration, the employees must in all other respects be supervised and perform on the job as if they were employees of the subcontractor.

7) **COMPLIANCE OF PROVIDER.**

- 8) To ensure that HUB requirements of this contract are complied with, the Department will monitor the Provider's efforts to involve HUBs during the performance of this contract. This will be accomplished by a review of the monthly State of Texas HUB Subcontracting Plan Prime Contractor Progress Assessment Report (Exhibit H-6) submitted to the Business Opportunity Programs Office by the Provider indicating his/her progress in achieving the HUB contract goal, and by compliance reviews conducted by the Department. The State of Texas HUB Subcontracting Plan Prime Contractor Progress Assessment Report (Exhibit H-6) must be submitted at a minimum monthly to the Business Opportunity Programs Office, in addition to with each invoice to the appropriate agency contact.

The Provider shall receive credit toward the HUB goal based on actual payments to the HUB subproviders with the following exceptions and only if the arrangement is consistent with standard industry practice.

- (1) Payments to brokers or firms with a brokering type operation will be credited only for the amount of the commission;
- (2) Payments to a joint venture will not be credited unless all partners in the joint venture are HUBs;
- (3) Payments to a HUB subprovider who has subcontracted a portion of the work required under the subcontract will not be credited unless the HUB performs a commercially useful function;
- (4) Payments to a HUB will not be credited if the firm does not provide the goods or perform the services paid for;
- (5) Payments made to a HUB that cannot be linked by an invoice or canceled check to the contract under which credit is claimed will not be credited.

A Provider must not withhold or reduce payments to any HUB without a reason that is accepted as standard industry practice. A HUB prime or subprovider must comply with the terms of the contract or subcontract. Work products, services, and commodities must meet contract specifications whether performed by a prime or subprovider.

A Provider's failure to meet the HUB goal and failure to demonstrate to the Department's satisfaction sufficient "Good Faith Effort" on his/her part to obtain HUB participation shall constitute a breach of contract. In such a case, the Department reserves the right to issue a letter of reprimand; to deduct the amount of HUB goal not accomplished by HUBs from the money due or to become due the Provider, not as a penalty but as damages to the Department's HUB program; or such other remedy or remedies as the Department deems appropriate.

9) **RECORDS AND REPORTS.**

- a. After submission of the initial commitment (Exhibit H-1), required by Section 2.c. of this attachment, the Provider shall submit State of Texas HUB Subcontracting Plan Prime Contractor Progress Assessment Report (Exhibit H-6) at a minimum monthly, after contract work begins, on subcontracting involvement. One copy of the State of Texas HUB Subcontracting Plan Prime Contractor Progress Assessment Report (Exhibit H-6) is to be sent to the Business Opportunity Programs Office of the Department monthly. In addition, the State of Texas HUB Subcontracting Plan Prime Contractor Progress Assessment Report (Exhibit H-6) must be submitted with the Provider's invoice. All payments made to subproviders are to be reported. **These State of Texas HUB Subcontracting Plan Prime Contractor Progress Assessment Reports are required monthly even during months when no payments to subproviders have been made.** The State of Texas HUB Subcontracting Plan Prime Contractor Progress Assessment Report will be required until all work on the contract has been completed. The Department may verify the amounts being reported as paid to HUBs by requesting copies of canceled checks paid to HUBs on a random basis.

WAs Used

Contract No. 15-5IDP5013

ERP Contract No. 4598

- b. Subproviders should be identified on the State of Texas HUB Subcontracting Plan Prime Contractor Progress Assessment Report (Exhibit H-6) by name, the amount of actual payment made to each during the billing period, cumulative payment amount and percentage of the total contract amount.
- c. All such records must be retained for a period of seven years following final payment, or until an investigation, audit, examination, or other review undertaken during the seven years, and shall be available at reasonable times and places for inspection by authorized representatives of the Department and other agencies.
- d. Prior to receiving final payment, the Provider shall submit a Final Report (Exhibit H-4), detailing the subprovider payments to the Business Opportunity Programs Office of the Department, and one copy to the Department with the Provider's final invoice.

12/06
HUB.ATT

EXHIBIT H-1**Texas Department of Transportation
Subprovider Monitoring System
Commitment Worksheet**Contract #: 15-5IDP5013 Assigned Goal: 23.7 % Federally Funded State Funded X Prime Provider: Klotz Associates, Inc. Total Contract Amount: \$2,000,000.00Prime Provider Info: DBE HUB Both Vendor ID #: 17601473485 DBE/HUB Expiration Date:

(First 11 Digits Only)

If no subproviders are used on this contract, please indicate by placing "N/A" on the 1st line under Subproviders.

Subprovider(s) (List All)	Type of Work	Vendor ID # (First 11 Digits Only)	D=DBE H=HUB	Expiration Date	\$ Amount or % of Work *
Jacobs Engineering Group, Inc.	Environmental, Schematic, Traffic	19540816360			20.00%
Cox McLain Environmental Consulting, Inc.	Environmental	12607199796	D H	11/05/2016 08/05/2019	3.50%
Arias & Associates, Inc.	Geotechnical	17427718394	D H	10/31/2015 02/11/2019	3.00%
Gonzalez-De La Garza & Associates	Surveying	12083430251	D H	09/30/2015 07/23/2017	8.00%
Cobb, Fendley & Associates, Inc.	Aerial Mapping, SUE	17421928791			4.50%
Concept Development & Planning, LLC	Public Involvement	12605240576	D H	12/19/2016 06/19/2019	9.00%
GRAM Traffic Counting, Inc.	Traffic	17428832665	D H	05/30/2017 11/19/2018	0.50%
Subprovider(s) Contract or % of Work* Totals					48.50%

*For Work Authorization Contracts, indicate the % of work to be performed by each subprovider.

Total DBE or HUB Commitment Dollars \$ Total DBE or HUB Commitment Percentages of Contract 24.00%

(Commitment Dollars and Percentages are for Subproviders only)

12/06 DBEH1.AT

EXHIBIT H-2**Texas Department of Transportation
Subprovider Monitoring System Commitment Agreement**

This commitment agreement is subject to the award and receipt of a signed contract from the Texas Department of Transportation (TxDOT). **NOTE: Exhibit H-2 is required to be attached to each contract that does not include work authorizations. Exhibit H-2 is required to be attached with each work authorization. Exhibit H-2 is also required to be attached to each supplemental work authorization. If DBE/HUB Subproviders are used, the form must be completed and signed. If no DBE/HUB Subproviders are used, indicate with "N/A" on this line:** _____ **and attach with the work authorization or supplemental work authorization.**

Contract #: _____ Assigned Goal: _____ % Prime Provider: _____

Work Authorization (WA)#: _____ WA Amount: _____ Date: _____

Supplemental Work Authorization (SWA) #: _____ to WA #: _____ SWA Amount: _____

Revised WA Amount: _____

Description of Work (List by category of work or task description. Attach additional pages, if necessary.)	Dollar Amount (For each category of work or task description shown.)
Total Commitment Amount (Including all additional pages.)	\$

IMPORTANT: The signatures of the prime and the DBE/HUB and Second Tier Subprovider, if any (both DBE and Non-DBE) and the total commitment amount must always be on the same page.

Provider Name: Address: Phone # & Fax #: Email:	Name: _____ (Please Print) Title: _____ _____ Signature Date
DBE/HUB Sub Provider Subprovider Name: VID Number: Address: Phone # & Fax #: Email:	Name: _____ (Please Print) Title: _____ _____ Signature Date
Second Tier Sub Provider Subprovider Name: VID Number: Address: Phone # & Fax #: Email:	Name: _____ (Please Print) Title: _____ _____ Signature Date
VID Number is the Vendor Identification Number issued by the Comptroller. If a firm does not have a VID Number, please enter the owner's Social Security or their Federal Employee Identification Number (if incorporated).	

EXHIBIT H-4**Texas Department of Transportation
Subprovider Monitoring System
Final Report**

The Final Report Form should be filled out by the Prime Provider and submitted to the Contract Manager and the Business Opportunity Programs Office for review upon completion of the contract. The report should reflect **all subcontract activity** on the project. The report will aid in expediting the final estimate for payment. If the HUB or DBE goal requirements were not met, documentation supporting good faith efforts must be submitted.

DBE Goal: ____%

OR

HUB Goal: %

Total Contract Amount: \$ _____

Total Contract Amount: \$ _____

Contract Number: _____

Vendor ID #	Subprovider	Total \$ Amt Paid to Date
TOTAL		

This is to certify that ____% of the work was completed by the HUB or DBE subproviders as stated above.

By: Prime Provider_____
Per: Signature

Subscribed and sworn to before me, this _____ day of _____, 20 __

Notary Public _____ County

My Commission expires: _____



This form must be completed and submitted to the contracting agency each month to document compliance with your HSP.

Contract/Requisition Number: _____ Date of Award: _____ Object Code: _____
(mm/dd/yyyy) (Agency Use Only)

Contracting Agency/University Name: _____

Contractor (Company) Name: _____ State of Texas VID #: _____

Point of Contact: _____ Phone #: _____

Reporting (Month) Period: _____ **Total Amount Paid this Reporting Period to Contractor:** \$ _____ -

[illegible]

Signature: _____ **Title:** _____ **Date:** _____

***Note: Prime contractors can verify subcontractor HUB certification status on-line at <http://www2.tbpc.state.tx.us/cmb1/cmb1hub.html>**

HSP-PAR Rev. 9/05